



# How Federal and State Agencies Are Addressing the Challenges of Sustainable Water Management in the West

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This chapter describes the various ways that state and federal agencies are attempting to address the water management challenges analyzed in chapter 3. It begins by sketching the variety of entities and institutions involved in water management—federal, state, local, tribal, public, and private. Then, the state programs and initiatives are discussed, followed by the federal programs. The chapter concludes with a discussion of the ways that the federal government and the states are working together on critical water problems, perhaps defining, through these activities, the new water resources federalism.

Although they are not addressed in precise order, this chapter revisits many of the central concerns raised in chapter 3 related to the sustainable use of existing supplies (including groundwater, efficient use, and other areas), modifying operations of existing projects improving governance, fulfilling obligations to tribes, continuing environmental protection/restoration, and protecting communities.

## *The Many Players*

Although the Western Water Policy Review Advisory Commission has focused primarily on the

role of the federal government in water management, clearly the states play an equally important and multifaceted role. Further, a great variety of local institutions and private organizations are important participants. As the Western States Water Council (WSWC) stated in *Water and the West Today*, "Every major set of competing interests in the use and management of water resources has fashioned institutions to advance those interests" (WSWC, 1997).

## **Private Interests**

The most basic water manager is the private rights holder. Whether the rights were acquired through application, inheritance, or purchase, the individual rights holder has a constitutionally protected private property right to use water. The rights are conditioned as to when, where, and how they can be used, and in what amount. Private rights owners are generally not part of a water group (other than a ditch company which conveys their water to them) and have a largely independent say regarding their management decisions. Groundwater pumpers can be even more independent.

Agricultural contractees of state or federal storage projects are organized by irrigation district and have

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other conditions attached to their water—who can use it, what it costs, and whether it can be transferred or used outside of district boundaries. In addition to the irrigation districts, private companies also contract for federal project water, often at higher rates. Powerplants are significant water users, as are many other industrial users such as high tech manufacturing firms. Most contracts are long term, usually for 40 or 50 years, and for relatively low cost (which is often determined at the time the storage reservoir was built).

Similarly, contractees for federally generated hydropower usually have long-term contracts based on embedded costs (essentially the cost of construction, operations, and maintenance), and although they do not use water directly (other than as the power is generated), they are strong stakeholders in water management decisions.

### **Nongovernmental Groups and Special Interests**

In addition to private rights holders, many private individuals—including rafters, fishermen, farm groups, and others—organize in groups to influence water policy. Some of these advocate their particular use or need. Others, including wildlife and water quality groups, are concerned about specific or broad issues.

Although these groups have little formal authority, they are nonetheless important stakeholders in the decision process. They may lobby, write letters, attend meetings, file lawsuits, and influence debate in every way they can. Those with water rights may object to these groups as not being stakeholders, but the groups consider themselves as the representatives of the public interest, and their involvement is recognized by administering agencies and the courts.

### **Local Governments and Special Districts**

Local governments also come in a number of forms, but all have legal standing and authority over certain aspects of water management. Local and substate/regional governments provide the greatest variety of institutions for delivering water resource services (WSWC, 1997). These services include urban and industrial water supply, irrigation, drainage, navigation, recreation, fish and wildlife enhancement, and environmental amenities. They vary in size. The Metropolitan Water District of Southern California, a large water wholesaler, has an annual budget almost as large as that of the Bureau of Reclamation (Reclamation). The majority, however, are small, single-purpose entities.

Irrigation districts were formed to contract with Reclamation for federal storage project water and to build and maintain the conveyance facilities to get the water to the fields. Conservation, grazing, watershed, and natural resource districts may be responsible for site-specific concerns such as groundwater management, wetlands protection, riparian management, environmental restoration, and nonpoint source remediation.

County governments often control many processes which can have strong impacts on rivers and lakes, including road construction, road maintenance, solid waste landfills, and land use planning. Cities control zoning and development, wastewater treatment, drinking water supply, recreational use, and flood planning. Either cities or counties may assume responsibility for environmental protection and restoration within their jurisdictional limits.

Large cities have a significant interest in water, primarily through water acquisition, delivery, and disposal. They may build their own storage systems, arrange transbasin diversions, generate hydropower, build large sewage lagoons and wastewater treatment facilities, contract with federal facilities, and create their own river segment hydrographs either for amenity or disposal purposes. A number of the West's largest cities have formed

the Western Urban Water Council, which has become an effective information and lobbying organization. Municipal water boards such as Los Angeles, Las Vegas, and Denver have gained reputations as powerful actors in their regions. Other coalitions, such as the Metropolitan Water District of Southern California (MWD), are recognized for their aggressive and innovative efforts to secure water for their members.

### **Tribal Governments**

Indian tribes and nations also are major players in water usage. As described earlier, most tribes and nations have significant *Winters* rights. These rights are often substantial, very senior, and not subject to beneficial use or other state doctrines. Most tribes' rights have not been quantified, much less actually secured and put to use, and often they have not been factored into the basin systems. As a result, the existence of unquantified tribal rights adds great uncertainty to all other rights holders in a given basin.

In addition to their water rights, Indian tribes and nations may have jurisdiction over other aspects of management (Olinger, 1997). Tribes may manage reservation water resources, manage their lands, control economic activity, and provide wildlife and other ecological protection. The U.S. Environmental Protection Agency (EPA) recognizes tribes and nations as equivalent to states, both in policy and under several environmental statutes. They are important participants in many coordinated programs and may be the initiators of such efforts. In the Northwest, tribes have their own hatcheries and fishing regulations, and several have joined

together in the Columbia River Inter-Tribal Fish Commission to provide watershed protection for salmon (Columbia River Inter-Tribal Fish Commission, 1996). The Pyramid Lake Paiute Tribe was one of the prime initiators of the agreement that was reached for the Truckee-Carson Rivers (Pratt, 1997, Western Governors' Association (WGA)/WSWC, 1991).

### **State and Federal Governments**

Both state and federal government roles, and the need for better coordination, are described in greater length in the balance of this chapter and elsewhere. States are the major arbiter of water allocation and water rights, but they increasingly play a number of other roles as well. Federal agencies have built and operate most of the largest water projects, have trust responsibility for tribes, are responsible for international agreements, and, through a number of statutes, protect and secure national interests.

### **International Agreements**

The United States has treaties with both Mexico and Canada regarding transboundary rivers. Major rivers such as the Columbia and Colorado are shared internationally, and a number of smaller rivers are as well. The main treaties affecting the Columbia, Colorado, Rio Grande, and Red Rivers establish flows to be delivered in the downstream countries and also establish water quality standards. Ancillary issues such as use of hydropower, fish populations, transboundary aquifers, and related water issues are covered either in separate agreements or through working relationships between the nations involved. Both borders have one or more boundary commissions or other committees to solve problems as they emerge.

## ***The Role of the States in Western Water Management***

States are regarded as having the primary responsibility for the allocation and use of water resources within their boundaries on behalf of the residents of the state. Historically, states have been most concerned with establishing the rules under which individuals may use water, supervising the allocation of water and its use, and sorting out disputes among and between users. Development of water has been driven primarily by users, often through local water districts, and with the support of states and the federal government.

States play a central role in water management because they are at the fulcrum between national and local concerns. States have the resources to help at the local level and the contacts to work with the federal agencies. In addition, states have delegated authority under a number of federal water programs. (See "The Changing Federal-State Relationship" in chapter 3 for additional discussion on this point.)

A generation ago, states' primary concerns were administering water rights and developing adequate water supplies to serve the rapidly growing water demands in an arid area. Delegation of water quality protection was still in its infancy, and ecosystem awareness was just emerging. Since then, the breadth of states' roles has expanded, together with state capacity to fill those roles. Roles filled by states today are described below, under the general headings of water supply, environmental protection, technical assistance, and other support roles.

## **Water Supply, Water Use, and Management of Droughts and Floods**

### ***Administering the Prior Appropriation Doctrine***

The bedrock of western water use is the prior appropriation system (WSWC, 1997) (see also "Protecting Productive Agricultural Communities" in chapter 3). In every western state, some public official or entity administers the state's programs for allocating the use of water resources. These programs involve a permit and application system administered by a person often referred to as the "state engineer," a quasi-judicial officer whose responsibilities are broadly defined and governed by state statutes and case law.

The cardinal principle of the appropriation doctrine is that priority is based on the proposition that "first in time is first in right." The doctrine thus protects those who put water to beneficial use against impairment of their uses by subsequent appropriators. An important characteristic of the appropriative water right is that, once vested, it becomes a constitutionally protected property interest which can be sold, leased, or otherwise alienated, although such transfers must be approved by the state. Historically, the prior appropriation system was developed to provide certainty to promote the investments of capital necessary to develop water supplies and to assure that any change in point of diversion or nature of use of a water right did not adversely affect the water rights of third parties.

Uses of appropriated water are closely circumscribed, and uses must be beneficial—that is, they must be for statutorily identified uses such as irrigation, domestic, or industrial purposes (over time, a few states have recognized other uses—such as fish and wildlife purposes—as beneficial). Beneficial use also refers to the manner in which

water is used. Before state waters became fully appropriated, excess withdrawals were not uncommon; but today, rigorous enforcement of reasonable and beneficial use is becoming much more important.

Most states have approved appropriation of all available surface water, although some states still have significant amounts of groundwater available. Water appropriated today is generally so junior in right that the appropriator can have little confidence in his or her ability to obtain a reliable supply of water other than in very wet years. Given the decline in construction of new storage in the past 2 decades, new demands for water are being met through market-like transfers, conducted through leases, water banks, and outright sales of water and/or water rights. All states allow transfers, and considerable reallocation takes place through them; but to date, almost all of these transfers have been conducted instate.

Idaho, California, Arizona, and Texas have established water banks. Colorado has perhaps the most active water market, with rights and water itself sold through a unique water court system (WSWC, 1997).

### ***Planning, Funding, and Developing Water Supplies***

Historically, states have worked closely with local water users, federal water development agencies, and the Congress to ensure adequate storage and delivery capacity to meet the demands of new users. The National Water Commission in 1973 estimated that states and local entities provided 57 percent of total historical expenditures for water resource development, with federal appropriations accounting for 26 percent and private expenditures accounting for 17 percent (WSWC, 1997). Users and local districts have been the prime impetus for water development.

Today, with the pace of growth in the West still strong (Case and Alward, 1997) and the demand for many new instream and offstream uses of water escalating, water supply continues to be a vital concern. Virtually every state expressed the need to provide additional supplies of water in the survey conducted by the WSWC for its report to the Commission (WSWC, 1997).

States also made it clear that storage projects today are unlike the large projects of the past. Rather, they are smaller, more efficient, and more environmentally sensitive (WSWC, 1997). Modifications to projects or their operation are more apt to be undertaken to provide flows for ecological purposes (virtually all river basins), to improve the operations of the entire system (the Dakotas), to assist rural communities (Montana and South Dakota), or to meet Indian water rights (Colorado, Arizona, Oklahoma, and Washington).

While early state water plans were often developed in response to federal water development proposals, states are now refining and revising their own plans to ensure the most effective use of their waters. States like Oregon, Montana, and Washington have engaged in large statewide exercises in joint planning with key interests. Texas recently passed legislation which calls for a comprehensive state water plan and regional plans which, among other things, will address drought response, conservation, development, and management.<sup>1</sup>

Increasingly, states are playing a larger role in financing their own water development. All western states have some type of water financing program, and a number of states are trying to levy user fees (WSCS, 1994). However, state funds are usually tight, too. Respondents from the state of Washington put it this way:

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<sup>1</sup> Texas Senate Bill 1, signed June 17, 1997, took effect September 1, 1997.

*Although water resources are acknowledged by nearly every interest to be a critical issue for the future of the state, the state financial resources being devoted to water have continually shrunk for four years. A large backlog of unaddressed water right applications has accumulated. Needed water right adjudications are being delayed. Enforcement of existing rights and instream flows is lax. Information collection is hampered. Capital projects are on hold (WSWC, 1994).*

### **Increased Efficiency**

With the prospects dim for finding significant new supplies of water, states are turning to ways to stretch available supplies, recognizing that conservation must be undertaken with full awareness of return flows and existing rights holders. A new policy adopted in the state of Washington has made conservation, if cost effective, the first choice for meeting new needs. Oklahoma and Texas have changed the definition of "beneficial use" to include conservation. California's Water Resources Control Board enforced its reasonable-use provisions of beneficial use in a widely reported order against the Imperial Irrigation District (IID) in 1986. The result was the 1988 ground-breaking agreement between IID and the MWD of southern California whereby MWD agreed to pay the costs of lining IID canals in exchange for MWD's receiving the conserved water for urban use.

Water transfers are a common and effective way to allow water to move to new uses. Some states allow rights holders to market conserved water as an incentive to conserve; in the 1980s, the state of Utah was able to find water for the Intermountain Power Project by allowing irrigators to sell a portion of their rights to the project and to use the proceeds for increasing onfarm efficiency. As a result, no agricultural loss occurred, and substantial water was made available for the powerplant. Texas' 1997

legislation includes a state water bank, other temporary water sales, and guidelines for interbasin transfers.

States are testing groundwater recharge as a way to store water, to replenish diminished aquifers, and to provide flexibility through conjunctive use. The state of Arizona is initiating large-scale groundwater recharge as a way of storing its Colorado River allotment being delivered through the Central Arizona Project and of recharging depleted aquifers. The state plans to draw on its groundwater during periods when Central Arizona Project flows are insufficient. Nevada currently operates four active large-scale artificial recharge programs for underground storage. Similarly, the state of Kansas is working with the city of Wichita on a pilot project involving recharge with excess flows and conjunctive use. Orange County has a long history of conjunctive use, and both the state of California and other local agencies are studying a number of conjunctive use projects. The Sierra Pacific Power Company in Reno has also conjunctively used groundwater and surface water for many years. The Nevada State Engineer's office has recently allowed the additional use of groundwater reserves when Truckee River supplies are insufficient or when water quality is impaired.

Onfarm efficiencies are being achieved through such tools as laser leveling of fields, low-head sprinklers, drip and surge irrigation, enclosed conveyance pipes, and low-water-use crops. Similarly, cities promote xeriscape, low-flush toilets, low-head showers, and other means to reduce urban usage. Increasing numbers of cities are using inverted block and other pricing techniques and are experimenting with different kinds of reuse. California is considering wastewater reclamation (recycling), as is Hawaii. Both states also are researching and testing less expensive

## *General Stream Adjudication*

General stream adjudications are complex and lengthy proceedings to recognize and quantify most, if not all, of the existing water rights in a river system, watershed, or other body of water. These proceedings are underway in many western and midwestern states, some involving only a few water users asserting a dozen water rights and others involving tens of thousands of parties claiming hundreds of thousands of rights.

As water uses developed in the West, courts were often unable to settle water rights conflicts since, under common law procedures, it was difficult to join all necessary parties in one suit. Also, future water users could not be bound by the court. After the turn of the century, many states addressed this problem by enacting comprehensive water codes that provided for administrative permitting of new water users and adjudication of existing water rights. Often, statutory water adjudications were called for by federal officials who were concerned that existing water rights on a river system be identified before reclamation projects could proceed. Some states conducted adjudications to quantify riparian water rights and integrate them into an appropriate water system.

Many statutory stream adjudications were frustrated by the inability of courts to require the participation of federal and tribal governments in the litigation. Congress attempted to solve this problem by passing the McCarran Amendment in 1952, which waives the sovereign immunity of the United States from suit in a general adjudication of all the water rights in a particular water system. Another 30 years passed before the U.S. Supreme Court clarified that these suits could go forward in state as well as federal court and that Indian water right claims, along with those of federal agencies, could be adjudicated in these cases.

General stream adjudications are often said to have three purposes: (1) to increase the title security of individual water users by allowing them to predict the risk of curtailment in times of shortage; (2) to improve state and private water management by developing information about water supply and existing uses; (3) and to quantify inchoate federal Indian and non-Indian reserved water rights that, because of their frequent senior status, have cast a long shadow over western water titles. The large adjudications begun in the 1970s and 1980s, however, resulted from broader trends in the West. These included the energy crisis of the 1970s, which threatened the rapid development of western resources including water; the continued growth and urbanization of the region's population; and the emergence of strong tribal governments and organizations dedicated to protecting tribal water resources.

Montana's adjudication, processing more than 210,000 water rights, is a statewide proceeding. Adjudications emphasizing major river systems, often as the result of large federal or tribal landholdings, are pending in Arizona, Idaho, Oregon, Washington, and Wyoming. Some states, such as New Mexico and Utah, have been gradually adjudicating most of their watersheds over many decades. Several states have completed adjudications of riparian rights (Nebraska, Kansas) or surface water rights (Texas), but their task has been made easier by the absence of federal or tribal claims. California adjudicates surface water or groundwater as necessary to solve local water management problems. Colorado has had a continuous, statewide water adjudication process since 1879. While most adjudications occur in state court, New Mexico's adjudications are uniquely divided between federal and state court. Important federal rulings influencing state court adjudications have been rendered in Arizona, Nevada, and Oregon.

Stream adjudications can be conducted as judicial proceedings, administrative proceedings, or a hybrid proceeding where the court and administrative agency cooperate. (Administrative adjudications are possible only in basins with no federal or tribal presence.) The cases can involve every type of water user including federal and state agencies; tribes; cities and towns; utilities; mines and other industries; irrigation districts; homeowners associations; and individual farmers, ranchers, and homeowners.

A typical adjudication begins with the petition of the state attorney general or engineers, followed by water users filing claims. The administrative agency investigates the claims and prepares a report or proposed determination of water rights for the court. Parties have an opportunity to object to the claims, report, or proposed determination; the court hears and resolves the objections. The court then issues a decree enforced by court-appointed officials, the state administrative agency, or both. Many disputes are settled in advance of trial; and, in recent years, major settlements have involved the large claim of federal agencies and tribes (National Park Service, Fort Peck, Fort Hall, Salt River Pima-Maricopa Indian Community, among others).

From start to finish, the adjudication process may take a few years, or even several decades, to complete. The cost of these cases is difficult to determine but certainly totals tens of millions of dollars in technical, legal, and court expenditures throughout the West.

- John E. Thorson, Special Master for the Arizona General Stream Adjudication. #



means for desalinization. Nevada is expecting to meet 15 to 25 percent of new municipal demand through conservation.

State and federal agencies provide technical assistance, information exchange, and incentives for encouraging these changes. In California, over 100 urban water agencies and 50 nonprofits signed a memorandum of understanding to implement certain best management practices; a similar effort initiated by state legislation is now being finalized for agricultural water conservation best management practices. Nevada changed its water law to allow temporary changes in water use, opening the door for municipalities to use poor-quality water sources for such activities as road construction, dust control, and other temporary uses. Oklahoma has created a leak detection program which provides funding to conduct water audits/leak detection surveys and to correct problems. Washington was one of the first states to adopt a water-saving plumbing code.

### ***Modifying Existing Operations***

As discussed in chapter 3, both state and federal agencies are assessing the need for changes in operations for facility rehabilitation and to gain greater efficiencies. California, Nevada, Wyoming, Idaho, and Colorado are among the states working with federal agencies to reconfigure flows through reservoir reoperation. Often initiated by the need to change flows for endangered species, improved efficiencies are nonetheless a result. Rehabilitation goes beyond facility reliability to include leak detection, reduction in reservoir surface losses, and lining canals. Colorado's Front Range Metropolitan Water Forum, established by Governor Roy Romer in 1993, is evaluating four areas: conjunctive use, effluent management, interruptible supply arrangement, and systems integration among the many separate water systems in the Denver metropolitan area.

### ***Groundwater Management***

Groundwater management has lagged behind management of surface flows. Groundwater withdrawals typically are treated separately, not as a routine part of the prior appropriation system, although over the last 30 years, prior appropriation systems for groundwater are becoming more common (Fort et al., 1993). Often states delegate groundwater management to local districts. Several states have designated priority or active management districts when overdraft has created serious problems.

States have considerable discretion on how they manage groundwater, and some states are beginning to recognize the groundwater/surface water connection. In Colorado, any aquifer whose flows will reach a stream within 100 years is considered tributary and must be treated as surface water, with water rights permits under the prior appropriation system. In 1996, Nebraska moved to recognize the groundwater/surface water connection in legislation passed to benefit the Platte and Republican River basins. The Nebraska natural resources districts have been given the authority to integrate management of groundwater and surface supplies as a way to implement solutions for water supply problems in those basins. Utah is developing integrated groundwater plans which will address safe yield, water quality, future appropriations, and other management issues needed to protect the resource.

In the 1980s, court cases related to interstate aquifers, including the Sporhase and El Paso decisions, made it clear that states that wished to protect their portion of such aquifers from interstate transfers would have to have soundly based management plans to justify the reservation of groundwater for instate use. These court decisions have spurred some states to develop statewide plans for aquifer management as well as plans for the total use of state waters.

## *California State Drought Water Bank*

In early 1991, California was facing its fifth consecutive year of below-average water availability. So little water remained in storage in federal Central Valley Project and California state reservoirs that some users faced the prospect of no deliveries and others of receiving only a small fraction of their normal supply. The state formed a Drought Action Team that, among other things, recommended establishing a water bank to purchase water from willing sellers to sell to others with crucial, unmet needs.

The California Department of Water Resources (DWR) moved ahead with establishing the bank in late February. First, it established the Water Resource Committee, consisting of representatives of both potential buyers and sellers, to draft a model contract. A price of \$125 per acre-foot was set, based on an evaluation of the user's opportunity cost—that is, what the user expected to earn by using the water. Remarkably, within 100 days the water bank had entered 351 contracts for the sale of 821,045 acre-feet of water.

Water came from three general sources: (1) surface water made available by temporarily fallowing (not irrigating) land; (2) surface water made available because of replacement supplies from groundwater; and (3) unused storage water. Land fallowing contracts accounted for 51 percent of the water. The quantity of transferrable water was based on an estimated consumptive use for particular crops. Groundwater exchange contracts provided 32 percent and stored water about 17 percent of the water.

DWR established priorities to guide its sale of water, beginning with health and safety-related emergency needs, then areas with "critical needs." Such areas included urban areas with less than 75 percent of their normal water supply and agricultural lands growing permanent or high-value crops. Twelve water agencies purchased 389,770 acre-feet of water from the bank at the fixed price of \$175 per acre-foot. More than three-quarters of the water went to urban uses. DWR stored about 250,000 acre-feet of purchased water in state reservoirs for use in the following year.

The state operated the water bank in 1992 and again in 1994 until a return to normal water supply conditions brought its use to a temporary end. Bank uses in these 2 years were more modest than in 1991. DWR made several important changes: it reduced its purchase price to \$50 and its selling price to \$72 (\$68 in 1994) per acre-foot, decided not to purchase water under fallowing contracts (because of concerns about local economic impacts when crops are not grown), and gave purchasers more flexibility concerning when they used the purchased water. #

### ***Drought and Flood Management***

The WSWC has long taken the lead in working with its member states to develop a model state drought plan (WSWC, 1987) and, as a result, most western states have plans in place. The focus of these plans has been on drought response, including monitoring, emergency actions, and mitigation for economic losses. Drought was the motivation for creating California's water bank, which allowed irrigators to supply their water to the bank at a state-fixed price for sale to communities and others needing additional water. State agencies in Montana, working with local conservation districts, developed portable irrigation diversion structures to use when stream-flows are low. Kansas has formed "assurance districts" on three key rivers to assure that water rights will be met during low-flow periods through state releases of state-owned water storage to raise water levels in the stream. In addition to individual state plans, the WGA, U.S. Department of Agriculture (USDA), Department of the Interior (Interior), Federal Emergency Management Agency, and the Small Business Administration have signed a memorandum of understanding to develop an integrated drought policy and plan to improve planning, communication, data, and response for current and future droughts. The memorandum establishes a council which will emphasize preventive, anticipatory, risk-management approaches to drought management (WGA, 1996).

Building on the success of its drought initiative, the WGA advocates a similar assessment for flood response. In a resolution adopted in June 1997, which recognized the primary role of the federal government for floods, the governors called for adoption of coordinated federal, state, and local policies to respond to and reduce flood damages. In particular, the governors propose starting with the report of the 1994 Interagency Floodplain Management Review Committee (the Galloway Report) to determine which recommendations are appropriate in the West, by reviewing other policy

guidance, developing recommendations for states, and providing strategies for local governments for regulating activities in flood plains (WGA, 1997a).

### **Environmental Protection**

#### ***Protecting the Public Interest***

For many years, states and local water users equaled the beneficial use doctrine with the public interest, but beneficial use applies principally to offstream, not instream, uses. There is a strongly emerging belief that the historic focus on water as a commodity that can be separated from the watersheds and rivers of the basin must be broadened. Values of the riverine system are far from trivial: they include habitat for fish and wildlife; focal points for enjoyment of scarce river and stream environments in an arid region; and mainstays of the economies of communities through recreation, tourism, and the attraction of permanent and seasonal residents and businesses. Today, with the increased recognition of instream values, some states are beginning to review water rights applications for their consistency with this aspect of the public interest. Several states require such a review for proposed transfers, and a few states have established a list of factors which must be considered in that review.

The public interest standard for issuing new rights has included considerations of efficiency, streamflow adequacy, water quality, public health, alternative uses that might be precluded, and effects on fish and wildlife, recreation, aesthetics, and even cultural values. Such criteria apply to new requests, not to the reexamination of existing water rights, with the exception of the public trust doctrine application in California.

The WGA/WSWC Park City Workshop II focused on defining the public interest (WGA/WSWC, 1991). One of its key findings was that there is no

single "public interest"—participants identified over 40 aspects of the public interest. Thus, decisions, policies, and actions are most likely to be in the public interest when they are reached in a manner that provides an opportunity for full participation and for a full range of values and interests to be considered. Public interest considerations are triggered by a number of state legal requirements for: public interest review, water quality and instream flow protection, area of origin protection, ad hoc negotiations, planning, voluntary transfers, public trust, and administrative review of rights.

As noted earlier in this chapter, some states (Alaska, California, Hawaii, Idaho, Oregon, Texas, and Washington) have changed state water law to expand the definition of beneficial use to better reflect contemporary needs and the public interest (Getches et al., 1991). Similar changes may be needed in other states, especially to encourage conservation and instream flow protection. Because beneficial use is the basis for the prior appropriation system, such changes to state law create a property claim rather than a public interest claim.

### ***Instream Flow Protection and Environmental Restoration***

Closely related to the public interest, instream flows are important for aquatic ecosystems, uses such as recreation, and simple aesthetics. Most states consider fish and wildlife needs as a beneficial use, but only a few have designated instream flows themselves a beneficial use. States have a variety of means to protect instream flows, if they choose to apply them. However, there are no standards setting a baseline or formula for minimum streamflows; actual protected flows vary site by site. As with public interest considerations, the application of instream flow protection prevents depletion beyond the minimum only in limited settings; although new

rights may be conditioned, rights which precede the instream flow laws or regulations are not affected by instream rights.

Some states have authorized public agencies to acquire existing rights or to appropriate new rights to instream flows to protect instream values, and a few states allow private parties to purchase and retire rights to protect the flows as noted earlier. Montana allows public entities to reserve unappropriated water for instream flows and permits water interests to lease existing water rights for the purpose of protecting flows. The state of Washington is working with tribes and federal agencies to develop a water budget which will benefit wild salmon by assuring the necessary amounts and periods of flow for both spawning migrations upstream and for smolt returning to the ocean. Washington also allows for state acquisition of "trust water rights," which may be acquired through purchase, lease, or gift, or by state or federal investments in water conservation. Texas has also created a Texas Water Trust to hold rights dedicated to environmental needs. Oklahoma and Idaho protect instream flows through their scenic rivers designations, while Kansas has basin-of-origin protection. Nevada's Washoe County and the cities of Reno and Sparks will be purchasing water rights to augment flows in the Truckee River in order to improve water quality.

In addition to protecting instream flows, a few states—usually in conjunction with federal agencies—are investing substantial funds in efforts to restore the functioning of rivers, wetlands, and riparian ecosystems, often to comply with the Endangered Species Act (ESA). At the basin level, these states have joined with federal agencies to participate in programs to restore hydrographs to more normal patterns, reshape rivers to enhance habitat, and restore flood plains. On the Columbia River, the Northwest Power Planning Council

## *The TMDL Dilemma*

The Clean Water Act of 1972 included a little noticed provision for addressing nonpoint sources of pollution—a standard for water quality known as a "total maximum daily load" (TMDL). After 20 years of worsening nonpoint pollution of rivers and streams, a number of environmental coalitions around the country filed approximately 30 lawsuits and intents-to-sue to force EPA to force states to address TMDLs. How EPA and the states resolve this crisis will significantly affect future state and federal relations over water management.

A TMDL is the amount of pollution a water body (lake, river, or stream) can absorb and still support uses such as drinking water, aquatic life, and recreation. The law requires that a state establish the allowable pollutant loading (and thereby the amount of pollution reduction needed) in each water body and that the state allocate the allowable load among all pollution sources, including point sources, nonpoint sources, thermal pollution, air depositions, effects from contaminated bottom sediments, and groundwater flows into the surface water.

The staff and funding needed to assess every water body in a state and to develop TMDLs (if warranted) is considerable, and the information needed for a comprehensive analysis may have significant gaps. Allocating the TMDLs has the potential for creating considerable conflict. Those living in a watershed are afraid that current uses may be curtailed or burdensome requirements imposed. Nonetheless, TMDLs are a way to move beyond generic standards to actually tie cumulative pollutants together within specific locations. They take a wholistic, geographic-based approach which supports watershed protection concepts.

Despite the difficulties in establishing TMDLs and managing according to them, states are beginning to have some success. EPA responded to a lawsuit filed in 1994 by working with the state of Idaho to develop a plan to establish TMDLs for each watershed over the next 8 years.

Basin Advisory Groups (BAGs) have been established in each of the six major basins in the state. BAGs include representatives of a number of interests—mining, forestry, cattle, agriculture, sportsman, environmental, nonmunicipal dischargers, local governments, tribes, and at-large representatives. BAGs are advisory to the Division of Environmental Quality. They set priorities, review the TMDLs, recommend the formation of watershed groups, review uses in the basin, review 319 applications, and in general provide guidance and coordination.

Watershed Advisory Groups (WAGs) are created where needed and cover 8 to 30 streams in the watershed.

WAGs are open to any interested party; 10 WAGs currently are in existence, with another 5 or 6 in process. The Division of Environmental Quality coordinates and covers basic expenses, and the Department of Water Resources can be asked to advise. Although the WAGs are primarily concerned with TMDLs and nonpoint sources, they can also take on other issues, such as habitat restoration. Issues brought by WAGs and BAGs are brought by the agencies to state policymakers.

The original lawsuit has been dismissed based upon Idaho's plan, and Idaho participants are determined to continue with the process, including implementation. They have learned that they prefer to determine their own priorities and action steps.

Utah is a second state moving forward with its TMDL process. Utah is undertaking one of its five major basins per year, with all of the basins being revisited once every 5 years. The Bear River assessment has been completed for Utah; but because it is a three-state river, efforts are now underway to coordinate with Idaho and Wyoming as well.

The legislature has funded detailed TMDL studies and data collection. In the Bear River, the state has allocated TMDLs to sources of contamination; animal waste is a large contributor of pollutants. Other entities—including other water quality programs (319), the National Resources Conservation Service (NRCS), conservation districts, and the extension service—have been brought into the process. As a result, the total funding has been 3-4 times, and technical assistance 10 times, that for TMDLs alone.

The state sees the TMDL process fitting within a watershed model, including local committees and participation. Because local residents recognize the potential for TMDLs to include considerations such as carrying capacity and future uses, they want to be involved, especially with other agencies such as NRCS.

In general, states which have programs or processes which can be adapted to include TMDLs are likely to find that the TMDL program is not a large burden. Wyoming, for example, has a number of coordinated resource management groups which are a logical tool for establishing TMDLs. South Dakota has a successful program where the state has provided facilitators, technical expertise, and local processes to determine on-the-ground options for other water quality programs. Montana's existing watershed program should also make the TMDL program easier. With little extra effort, these processes should lend themselves to establishing TMDLs. #

administers approximately \$400 million a year from Bonneville Power Administration revenues for salmon recovery programs. The Northwest Power Planning Council was created as a four-state interstate compact through federal legislation. In California, state and local agencies are spending millions of dollars in research, pilot testing, and construction projects to make water projects and diversions more fish friendly. Recently, California's first pool-and-chute fish ladder was constructed on an agricultural diversion. Additional expenditures in the California Bay Delta and on the Missouri, Colorado, and Platte Rivers, to mention only a few, come to large dollar amounts for both state and federal agencies.

Wetlands recovery currently tends to be addressed through the Natural Resources Conservation Service working through local conservation districts and the U.S. Fish and Wildlife Service's (Service) Partners for Wildlife Program, while both the U.S. Army Corps of Engineers (Corps) and EPA have permitting jurisdiction.

### ***Protecting Water Quality***

Nearly every state has delegation from EPA to protect water quality under either the Clean Water Act (CWA) or the Safe Drinking Water Act (SDWA). Under CWA delegation, most states issue National Pollutant Discharge Elimination System permits for point sources of pollutants. States follow EPA-established, technology-based standards to limit "end-of-the-pipe" discharges, but then determine whether the federal standards are sufficient, based on state stream quality standards. If not, states establish water-quality-based effluent limitations, based on designated uses and numeric criteria for specific stream segments. States are also required to adopt plans for addressing nonpoint sources of pollution from mine runoff, logging, urban discharges, and farm and irrigation return

flows. Such plans need not be enforceable, nor are there federal standards for such plans.

Under SDWA delegation, states have enforcement authority to protect the safety of public drinking water systems according to EPA-established maximum contaminant levels. States that assume primacy must also establish an approved underground injection control program that regulates underground disposal of wastewater within a quarter of a mile of underground drinking water sources. EPA also has created a state revolving fund which states can use to grant funds for treatment plants. Under the 1996 amendments to the SDWA, states will be required to delineate source water protection areas for community water systems.

Current innovations in water quality protection tend to focus on nonpoint source problems. Using funds authorized under section 319 of the CWA, Nevada successfully tested the use of alum as a coagulant to remove sediment and phosphorus from a severely degraded stream. Nevada has also developed artificial wetlands to improve water quality in streams. Some states, working with local conservation districts and others, are beginning efforts to keep cattle out of selected riparian areas, develop buffer zones next to streams, regulate chemigation, and require construction setbacks from streams and other measures to reduce nonpoint source pollutants. The Montana legislature passed a law in 1991, allowing counties to form districts for the sole purpose of protecting, maintaining, and improving water quality. Montana provides a number of good examples of ways that states protect water quality; it has adopted the Montana Water Quality Act, Montana Solid Waste Management Act, Montana Hazardous Waste and Underground Storage Tank Act, Streamside Management Zone Law, Montana Groundwater Assessment Act, Montana Agricultural Chemicals Protection Act, Lakeshore Development Act, Natural Streamside and Land Preservation Act, nonpoint source control programs, and pollution prevention programs.

An issue of growing importance to both states and EPA is that of total maximum daily loads (TMDLs). A TMDL is the amount of pollution a water body (lake, river, or stream) can absorb and still support uses such as drinking water, aquatic life, and recreation. It must meet state water quality standards. The law requires that a state establish the allowable pollutant loading (and thereby the amount of reduction needed) in each water-quality-limited water body and that the state allocate the allowable load among all pollution sources, including point sources, nonpoint sources, thermal pollution, air depositions, effects from contaminated bottom sediments, and groundwater flows into the surface water. On the books since the Clean Water Act was passed in 1972, TMDL requirements were largely ignored until the 1990s, primarily because of the difficulty of achieving them. Approximately 30 lawsuits or intent-to-sue notices have been filed by various environmental groups to force compliance with the law by both states and EPA.

States are required to list (Perciasepe, written communication, 1997) all water-quality-limited water bodies in the state and to prioritize them, in order to maximize environmental benefits by dealing with the most serious water quality problems and most valuable and threatened resources first. EPA guidelines provide the following criteria for prioritizing stream segments:

- Risk to human health and aquatic life
- Degree of public interest
- Recreational, economic, and aesthetic importance of a particular water body
- The vulnerability of a water body as aquatic habitat

Following approval of the list and priorities, states are supposed to develop the allowable TMDLs for those prioritized waters, drawing on information

from existing state and federal water quality programs and on new data assessment, including biomonitoring. The state is then to develop a water quality management plan to achieve the approved TMDLs. States must provide EPA with updated lists of affected water bodies in April of every even-numbered year. The process to move through all water bodies in an entire state is anticipated to take from 8 to 13 years, based on 1998 lists for the initial assessment. As uses on streams and lakes change or new information becomes available, updated TMDLs will be done.

Although all states are proceeding in the face of the lawsuits which have been filed or threatened, TMDLs pose a range of problems for them. A given state's capacity to fulfill both TMDL and other water quality requirements is determined by the number of stream miles, the wide range of pollutants and sources to be considered, the level of information available, and the resources required to comply. The criteria for prioritizing stream segments are not the same as state beneficial uses, and they create a clear prospect for conflict between water quantity and quality agencies. Moreover, once completed, states are concerned that the results will still not be scientifically valid.

Various groups in Wyoming, for example, object to the application of TMDLs to nonpoint sources, which they view as a shift from congressional intent to apply TMDLs to point sources. They add that the current nonpoint source program is voluntary where TMDLs have the potential to become regulatory. Local land managers point out that individual nonpoint sources rarely contribute more than 5 percent of pollutants and that the expense of determining the allocation of TMDLs is not an effective way to proceed. Wyoming contends that many partnerships have been addressing water quality involving landowners and permittees, environmental groups, and state and federal agencies. The fear is that TMDLs are being pushed by environmental groups in their threatened lawsuits

so the groups can determine the conditions of future logging, grazing, and oil and gas permits.

At the same time, the TMDL process causes states to take a holistic, geographic-based approach, and it is being used to support watershed protection because it begins to come close to the concept of determining carrying capacities for watersheds and basins.

A Federal Advisory Committee Act group has been established to recommend steps to improve the TMDL program. It hopes to accommodate regional differences concerning point and nonpoint pollution source measures and alternative needs in a principled way, with what is referred to as "objective flexibility." Objective flexibility implies that national objectives will be established but responded to with flexibility. The Federal Advisory Committee's report is expected to be issued in mid-1998. The WGA passed a resolution in June 1997, that recognizes both the goals for TMDLs and the problems, including the likelihood that neither states nor the EPA may have the resources necessary "to conduct the extensive field measurements and computations needed to establish scientifically defensible TMDLs on each applicable water body in the states in the proposed time frame" (WGA, 1997b). While supporting the goals of the Clean Water Act, the governors urge EPA to work cooperatively with states to implement a program with flexibility to accommodate state and local conditions, with realistic funding needs, and with a watershed- and incentive-based approach.

The lack of linkages between water quantity and water quality agencies within state government has been a longstanding criticism from other arenas. Although most western states are taking steps to link quantity and quality, as yet California is the only state which integrates the two under the Water Resources Control Board. Washington and Texas have combined the programs in the same agency, while Kansas and Utah have created formal linkage

mechanisms through memorandums of understanding signed by the quantity and quality agencies. Seven others—Idaho, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, and Texas—have various cooperative mechanisms, such as overlapping board or committee assignments (Getches et al., 1991).

### ***Groundwater Protection***

Except for provisions of CWA concerning injections near drinking water supplies, groundwater is not covered by its own federal water quality legislation, although many federal laws have implications for groundwater. Management of groundwater quality has largely been left to states.

In 1992, EPA issued its *Final Comprehensive State Ground Water Protection Program Guidance*. That document, which details plans for comprehensive state groundwater protection programs, was the result of a series of meetings among EPA, the states, tribes, and local governments. The goal for these programs is to ensure protection of drinking water supplies and maintenance of the environmental integrity of ecosystems associated with groundwater (EPA, 1992). States are given the primary role of coordinating all groundwater-related programs using a resource-based approach. They are to establish groundwater protection goals and priorities; define roles, responsibilities, and coordinating mechanisms; implement the plans; coordinate information collection; and improve public education. While some states have sought EPA approval, others have proceeded with development of comprehensive state programs independently, seeking to avoid the need to meet EPA specifications. There is no comprehensive assessment of the adequacy of state programs in protecting and remediating groundwater.



## ***State of Oregon Growth Management Program***

In 1973, Oregonians passed important laws to protect their landscape and provide orderly ways for planning new development. The legislature created a new citizen board, the Land Conservation and Development Commission, which created 19 statewide land use planning goals. All Oregon cities and counties work to meet these goals through local land use plans. The job of the Oregon Department of Land Conservation and Development is to be sure these goals continue to be met.

Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to have a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. Plans are reviewed for consistency by the Commission. When the Commission approves a local government's plan, the plan becomes the controlling document for land use in the area.

The state does not write comprehensive plans. It doesn't zone land or administer permits for local planning actions like variances and conditional uses. And unlike some other states, Oregon does not require environmental impact statements.

### **Urban Growth Boundaries**

One of the most notable features of the Oregon land use program, and most relevant to the issue of urban encroachment into farming and riparian areas, is the concept of an "Urban Growth Boundary." Goal 14 requires each city to adopt a boundary "in a cooperative process between a city and the county or counties surrounding it." The boundary is drawn considering several factors, including expected growth, land suitability, and efficient provision of urban services and infrastructure. The boundary then defines the limits of urban growth, protecting surrounding areas from uncontrolled development and land speculation.

To amend an Urban Growth Boundary, a city must comply with the "exception" requirements defined in the Statewide Planning Goals. Between 1987 and 1990, 52 proposals to expand boundaries were approved. Oregon's 15 years of experience have shown that urban growth boundaries can be highly effective. They have saved a great deal of farmland from urban sprawl; led to better coordination of city and county land-use planning; and brought greater certainty for those who own, use, or invest in land at the city's edge.

### **Citizen Involvement**

It's no coincidence that citizen involvement is the first among Oregon's 19 planning goals. Extensive citizen participation has been the hallmark of the state's planning program from its outset. Every city and county has a committee for citizen involvement to monitor and encourage active citizen participation. The State's Citizen Involvement Advisory Committee also encourages participation in all aspects of planning. #

### ***Land Use and Growth Planning***

As described in earlier chapters, growth in the West can have direct impacts on aquatic ecosystems, on water supplies, and on agriculture. Politically, it has been very difficult for states to address growth management in the West by any means—partly because growth is usually considered good, partly because it is considered a matter of local concern, and partly because of western aversion to planning and controls. That attitude is starting to change (Case and Alward, 1997; Riebsame, 1997b), as shown in a recent article in *The Denver Post*: ". . . Colorado has finally stopped seeing bodies as dollars. Each immigrant carries a price tag: sprawl, smog, higher housing prices, higher wage rates" (Carrier, 1997). Governor Romer's Smart Growth Initiative, transportation campaigns, and people's concern for the quality of life are credited for making it possible to consider such steps as taxsharing, growth boundaries, housing limits, purchases of open space, and conservation trusts and easements. Utah has also initiated a state growth initiative and has considered water supplies and policy as a factor, although transportation was seen as much more important in determining patterns and rates of growth.

The WSWC prepared a report on the role of water in growth management for the WGA in 1995 (WSWC, 1995). Although concluding that water is not the best vehicle to use for growth management, the report also points out the ways that its use affects growth.

A number of states, including Arizona, California, and Colorado, are trying to overtly link new development to having an assured water supply.

### **Technical Assistance and Other Support Roles**

#### ***Improved Water Data and Information***

States are developing geographic information systems, decision support systems, adaptive management programs, and other means to integrate data from a variety of sources for broad geographic reaches.

California, for example, has the heavily used California Irrigation Management Information System which gathers data from agro-climatic stations all over the state to calculate the evapotranspiration rate. Farmers and urban users (e.g., park and golf course managers) call in to use the information for scheduling irrigation.

Kansas is developing a way to obtain data in the Rattlesnake Creek basin to monitor the relative level of compliance with permit conditions. This will be used as a baseline to establish anticipated overall compliance throughout the state and to determine staff allocations.

Oklahoma has established a council of agencies and universities to develop a strategy to implement the Geographic Information Systems (GIS). The GIS will then be used as a planning tool for water system managers and resource professionals.

Colorado is developing a suite of tools to help with water planning and management, including the Colorado River Decision Support System, the South Platte Water Rights Management System, Hydrobase, the Satellite Linked Monitoring System, and, eventually, the Colorado Water Decision Support System. The goal is to integrate all these tools into one statewide technical information system.

The Northwest Power Planning Council has pioneered use of the concept of adaptive

management in the West, testing scenario development for power management, monitoring various fish strategies, and trying to define carrying capacities for rivers, among other uses. What is important about these efforts is that they link social, economic, and ecological information into a flexible, iterative way of learning and adjusting.

### *Assistance for Rural Communities*

Many states are concerned about the adequacy of rural domestic water supplies, the source of which is often groundwater of marginal quality or quantity or streams which may be too shallow in times of drought. Few communities have backup supplies if problems develop, and many rural residents must haul their own drinking water.

Rural communities also face difficulties with the cost of compliance in terms of testing supplies or putting required technical solutions in place. The Montana Department of Environmental Quality estimates that \$165 million will be required for 180 public water systems and \$160 million for improvements to 191 wastewater facilities. Nebraska pointed out compliance costs associated with sample collection, lab analysis, reporting, public notification, and system compliance (WSWC, 1997).

Still other communities lack personnel with the technical expertise to operate sophisticated water and wastewater treatment facilities. A Utah comment was: "Oftentimes the operator of the wastewater treatment plant also operates the water treatment plant, as well as takes care of the cemetery." Idaho reported a lack of expertise to develop programs that are understood and accepted at the local level. Washington cited the fact that the vast majority of 20,000 separate public water systems serve 15 or fewer hookups; small systems that cannot afford professional staff are then compelled to use expensive outside help.

Many states have developed rural assistance funding programs, including California, Hawaii, Montana, Texas, Utah, Alaska, Nevada, and South Dakota. Others, including Nebraska, Colorado, Montana, Utah, Oregon, Alaska, and Washington, provide technical assistance. Utah, for example, employs two circuit riders who travel throughout the state to provide assistance, while Nebraska has an Environmental Training Center to train operators.

### *Collaborative Partners and Problemsolver*

Increasingly, states are participating in partnerships. Sometimes they provide the leadership to establish and support the partnerships, while at others they facilitate or mediate disputes. At still other times, they are merely participants. Circumstances usually determine the appropriate role for state and federal agencies, whether it is as leader, equal partner, or assistance providers. As experience is gained, states are considering guidelines for when and how they should take an active role.

In the early 1980s, states recognized that litigation which resisted Indian water or fishing rights and other tribal positions cost them large amounts of money with very little success, and they turned to negotiations as an alternative. These negotiations generally involved the relevant federal, state, and tribal agencies along with local governments, local water users, environmentalists, and others with a legitimate interest at stake. Although the resulting water settlements have had mixed success in implementation, the parties involved were usually satisfied with the results when they led to water rights solutions and helped build greater trust, which assisted in the resolution of yet other problems.

At about the same time, arising from the Bureau of Land Management's (BLM) Experimental Stewardship Program and others, land- and watershed-based partnerships were formed to deal with issues of resource management. Using such

processes as Coordinated Resource Management, state and federal agency representatives met with private land, permit, and rights holders to solve problems on the ground; again, participants were generally satisfied because problems were solved and relationships were established.

As success stories were recognized and as ecosystem approaches became more common, many states began adopting or providing incentives for such shared decisionmaking to address complex resource issues. Through initiatives such as EPA's community-based approach and the support provided by BLM and National Resources Conservation Service (NRCS) for coordinated resource management activities, federal agencies also recognized partnerships as a valid way of reaching goals.

The state of Oregon has developed perhaps the strongest statewide approach to support watershed partnerships. The state water agency, in cooperation with other relevant state agencies, has organized the state in regions to provide technical assistance to partnerships within their regions. A legislatively funded Governor's Watershed Enhancement Board provides seed and other funding to support watershed activities. Washington, Montana, and Alaska also have active statewide programs to promote and assist watershed partnerships. Other states, while not establishing a statewide watershed plan, work with and provide assistance to those partnerships within the state that have formed independently.

Other states have tried to work out conflicts by creating offices for dispute resolution. North Dakota created a state/private sector partnership called the North Dakota Consensus Council to assist any state agency with disputes. That Consensus Council is now expanding to serve the High Plains States and Canadian prairie provinces in a program called the Transboundary Initiative and has recently received a grant to provide assistance to the 18 state

dispute resolution offices nationwide. Of the 18, 9 are located in the West, with a variety of structures and agency locations. Montana has also established a public-private Consensus Council within the Governor's office, modeled in part after the North Dakota council.

Other states are considering setting up such councils or are turning to facilitators and alternative dispute resolution techniques. For example, South Dakota's Department of Environment and Natural Resources uses private contractors and partnerships routinely for water quality projects, and the Oklahoma Water Resources Board is currently using a facilitator to mediate disputes involving the state's rural water systems. New Mexico is attempting to employ alternative dispute resolution (ADR) in adjudications by tying funding levels to the use of ADR.

### **Future Directions for State Activities**

In a time when problems and complexities seem to grow faster than solutions, the indication is that in the future, states, as well as others, will need to be more willing to experiment with processes outside historic patterns of behavior, including processes that address problems in ways that incorporate a wider range of participants and causative factors.

States can benefit from learning from each other. For any water problem in the West, one or more states can be identified which are implementing new solutions. These efforts provide a model and a test of success for the other states and often for the federal government.

For example, most states have an orderly process for transfers that allows water use to be changed. The amount of protection each state provides for equity and the public interest varies, and it is important to remember that the highest economic use is not necessarily the same as the highest public good.

Other future directions:

- States will benefit by looking more generally at reoperation of their facilities and flows. Clear evidence now exists that groundwater recharge and conjunctive use are very cost-effective ways to optimize water resources. To create incentives for developing "found" water—water freed up through conservation or better operations—alternative uses should be allowed.
- States have the authority and responsibility to ensure that waters are put to beneficial use.
- States should also help identify ways to quantify and adjudicate Indian water rights more quickly.
- States can also strengthen their capacity for developing their science and data bases to assist and back up management decisions.
- States will find that sustainability of the resource will become the principal criterion for water management. A better understanding of what sustainability means for a river or other water source is needed.
- States are contemplating ways to take into account the broader public interest. Although the public interest is not always easy to define, ignoring it leads to lawsuits and potentially greater input and involvement at the federal level.
- States could allow the dedication of private rights for instream flows as a voluntary way of solving the need for minimum flows.
- To the extent they have not already, all states would benefit themselves and the

resource by adopting a watershed approach as a way to integrate concerns.

- States should foster effective watershed partnerships by providing support, technical assistance, and openness to implementing group recommendations.
- All states should consider how to integrate across programs and levels of government within their own state and thereby facilitate improved collaboration.

### ***The Federal Programs and Activities Related to Western Water***

There are 15 federal bureaus and agencies with water-related programs operating in the western states, responsible to 6 cabinet departments, 13 congressional committees, and 23 subcommittees, and funded by 5 different appropriation subcommittees (EOP Group, 1997; WGA, 1989). Measured in terms of expenditures of federal funds, the Corps is the most significant of these agencies. Its 1997 budget authorizes Corps expenditures of \$944 million in the 19 western states (out of a total agency budget of over \$3 billion), compared to \$774 million for Reclamation and \$778 million for EPA. Table 5-1 shows the distribution of 1997 budget authority by state for the Corps, Reclamation, and EPA (EOP Group, 1997).

As described in chapter 4, the federal role in western water has grown and changed during this century. Planning, financing, and constructing projects needed to regulate rivers for water supply, flood control, navigation, hydroelectric power generation, and recreation remains important. But there has been a marked decline in the number of new federal water projects authorized for construction by the Congress since the 1970s. Moreover, the nature of

## Chapter 5

Table 5-1.—1997 discretionary funding by state  
budget authority  
(Millions of dollars)

	Corps of Engineers	Bureau of Reclamation	Environmental Protection Agency	Total
Alaska	19		56	75
Arizona	10	81	31	121
California	225	112	192	529
Colorado	5	16	25	46
Hawaii	5		26	31
Idaho	14	1	24	39
Kansas	27	0	24	51
Montana	12	1	23	35
Nebraska	13	1	20	34
Nevada	13	4	21	38
New Mexico	14	5	19	38
North Dakota	18	23	19	61
Oklahoma	51	2	27	80
Oregon	118	13	31	162
South Dakota	26	44	19	88
Texas	189	26	114	328
Utah	4	27	18	50
Washington	179	8	67	255
Wyoming	1	1	21	24
Undistributed subtotal:		<sup>1</sup> 409		409
Western states	944	774	778	2,495
Percent of total (%)	27	100	24	34
Other states and territories	2,248		1,764	4,012
Undistributed	<u>267</u>		<u>659</u>	<u>926</u>
Total	3,458	774	3,201	7,433

<sup>1</sup> These funds were not allocated in the appropriations act to projects in specific states. They include operations and maintenance (O&M) (\$268 million), general administrative expenses (\$46 million), miscellaneous construction and dam safety (\$117 million), science (\$7 million), and unallocated construction reductions (-\$29 million).

Sources: 1997 Conference Report for Energy and Water Appropriations (House Report 104-782) and Budget Information for States, Budget of the United States Government, Fiscal Year 1998 (Office of Management and Budget).

the projects being authorized is shifting from large-scale, multipurpose facilities to smaller, less costly, more targeted projects. Generally, project beneficiaries are required to pay a somewhat larger share of project costs than in the past.

## Environmental Protection and Tribal Rights Emphasis

Increasingly, federal water programs and policies emphasize environmental protection, as indicated in the following legislation:

- The National Environmental Policy Act (NEPA) makes environmental protection a national policy and requires all major federal actions with potentially significant environmental consequences to go through an extensive review process that evaluates likely adverse environmental effects, considers less environmentally damaging alternatives, and discloses these findings to the public (42 U.S.C. §§ 4321-4370c).
- The 1972 amendments to the Federal Water Quality Control Act establish a national program with the stated objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters (33 U.S.C. § 1251(a)).
- The Safe Drinking Water Act requires national standards for drinking water supplies (42 U.S.C. §§ 300f-300j-26).
- The Wild and Scenic Rivers Act effectively withdraws designated river segments from additional water development (16 U.S.C. §§ 1271-87).
- The ESA establishes a policy that federal departments and agencies use their authorities to recover threatened and

endangered plant and animal species, prohibits federal actions likely to jeopardize the continued existence of such species, and prohibits any persons from "taking" an endangered species of fish or wildlife (16 U.S.C. §§ 1531-44).

- Some farm programs administered by USDA now actively promote water quality and wetlands protection.
- Environmental protection has been made a part of the Corps' mission.
- An increasing share of Reclamation's funding now goes to environmental protection activities.
- The Federal Energy Regulatory Commission (FERC) must give equal consideration to fish and wildlife values and the preservation of environmental quality, along with energy development in licensing hydroelectric power facilities (16 U.S.C. §§797(e), 803(a)).

In addition, the federal government has taken a more active role in assisting tribal efforts to clarify their water rights and enjoy the benefits of water. The Department of Justice represents tribes in the various legal proceedings around the West in which tribal water rights are at question. Interior has supported efforts to reach negotiated agreements that clarify tribal water rights, and the Congress has provided funding to help implement these agreements. Interior, through the Bureau of Indian Affairs (BIA) and Reclamation, is helping develop water supplies for use on reservation, and EPA has been supporting tribal efforts to establish their own water quality programs.

## **Federal Support for Water Development**

As described in chapter 4, the primary task of Reclamation, the Corps, and USDA (related to western water) has been to construct dams and other structures on western rivers and streams for flood control and water supply purposes and to provide financial assistance for others to do so. New project construction and funding continue to be part of their missions are diminishing in importance. Moreover, the nature of federal water projects and the terms under which federal support is available are changing.

### ***The Bureau of Reclamation***

Viewed in budgetary terms, Reclamation still remains primarily a construction agency. In the 1980s, construction funds accounted for about 75 percent of its appropriations, but there has been a marked decline in the number of congressionally authorized Reclamation water projects since the 1970s. The last Reclamation traditional irrigation project approved by the Congress and constructed by Reclamation (North Loup Project in Nebraska) was authorized in 1972. By fiscal year 1997, construction accounted for only about 40 percent of total Reclamation appropriations, which began to decline in the 1990s and which, by 2002, are projected to be 33 percent less (in constant dollars) than 1997 levels (EOP Group, 1997). The number of employees has declined as well.

The nature of new Reclamation projects is changing. More than a third of the Reclamation projects authorized since 1979 are demonstration projects for wastewater recycling or water reuse, while only a quarter involve traditional multipurpose projects (Cody, 1997).

The financial terms under which new Reclamation projects will be planned and constructed also are changing. The Reagan Administration initiated new

cost-sharing requirements for project planning in 1984 and made it clear that it would support only new Reclamation water projects in which "partners" would agree to pay some part of the costs of project development. The 1986 Water Resources Development Act requires a 50-percent cost share for new project planning and engineering for both Reclamation and Corps projects. As discussed below, this statute also requires cost sharing for the first time for flood control-related projects and project features. Reclamation requires a 50-percent cost share for project feasibility studies; in 1992, the Congress instituted special rules related to cost sharing for appraisal studies and construction of water recycling and reuse projects (Title XVI, Public Law (P.L.) 102-575). In 1996, Reclamation established a policy providing that Reclamation water project beneficiaries will be responsible for funding their share of capital improvements to existing projects, while Reclamation will fund costs allocated to nonreimbursable purposes such as fish and wildlife (Reclamation, 1996b).

Reclamation remains responsible for the facilities it has constructed since 1902, even though operation and maintenance for part or all of most projects have been turned over to the water districts that are the primary project beneficiaries.<sup>2</sup> As the agency's dominant emphasis shifts away from new project construction, it has reorganized itself to better meet its ongoing responsibilities for administering existing projects. The five Reclamation regions in the 17 western states have been divided into 26 areas—generally along hydrologic lines—with a manager responsible for all projects within the area. Substantial authority has been given to these managers to administer projects within their areas.

In the 1982 Reclamation Reform Act, the Congress required all water districts receiving Reclamation project water to prepare water conservation plans

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<sup>2</sup> Reclamation reports that water districts are responsible for O&M for 398 of 631 project facilities.



## ***Yakima River Basin Water Enhancement Project***

On October 31, 1994, President Clinton signed The Yakima River Basin Water Enhancement Project (YRBWEP), Title XII of Public Law 103-434, into law, authorizing the construction of the Yakima River Basin Water Enhancement Project. The enhancement project was the culmination of more than 15 years of intense negotiation between irrigators in the Yakima River basin, the Yakama Indian Nation, and the environmental community over water for fish versus water for irrigated agriculture. The enhancement project will protect, mitigate, and enhance fish and wildlife and improve the reliability of irrigation water supplies through construction of water conservation projects on irrigation districts.

This law also created two entities for establishing these water rights. First, it created a pilot program to begin water acquisitions and address the legal and institutional aspects of acquiring water rights and converting them to instream flows. Second, a Conservation Advisory Group (Group) was formed to create a Basin Conservation Plan.

### ***Pilot Program***

This legislation identifies water acquisition as one method to enhance instream flows for anadromous fish. As a forerunner to a full-scale water acquisition program authorized under the YRBWEP, the Upper Columbia Area Office of Reclamation undertook, in cooperation with the Environmental Defense Fund, a 2-year pilot water acquisition program. The pilot program addressed the legal and institutional aspects and public acceptability of acquiring water and transferring it to instream flow purposes. The pilot program began in fiscal year 1995 and extended through fiscal year 1996.

In 1996, Reclamation leased water rights from three irrigators for a total of approximately 9 cubic feet per second. As a result, approximately 450 acres of land were temporarily fallowed, and the irrigation water rights were protected as an instream flow pursuant to Washington state law. The price for the leased irrigation water rights ranged from approximately \$23 to \$40 an acre-foot. The pilot program helped assure the viability of the water acquisition program.

The Yakima Area Office currently is implementing the Yakima Basin Water Acquisition Program authorized under the YRBWEP. The YRBWEP authorizes Reclamation to seek leases, dry year lease options, permanent water acquisitions, acquisition of land with appurtenant water rights, water banking, or other innovative measures to acquire water for instream flows for the benefit of anadromous fish. Water rights under this program are acquired from willing sellers or lessors and protected as an instream flow right.

For irrigation season 1997, Reclamation leased irrigation water rights from four irrigators, for a total of approximately 18 cubic feet

per second. Approximately 872 acres of land are temporarily fallowed, and the irrigation water rights are protected as an instream flow. The price for the leased irrigation water rights ranged from approximately \$23 to \$35 an acre-foot..

To date, Reclamation has only leased water rights under this program but is pursuing opportunities for permanent water rights acquisitions or permanent acquisition of land with appurtenant water rights.

### ***Conservation Advisory Group***

The water conservation program is based on a Basin Conservation Plan being developed by a federally appointed Conservation Advisory Group (Group). The Group consists of six members appointed by the Secretary of the Interior. These six members individually represent the nonproratable irrigators, proratable irrigators, Yakama Indian Nation, environmental interests, Washington State University Agricultural Extension Service, and the Washington State Department of Fish and Wildlife.

The Group is a nonvoting, consensus-seeking body with a 5-year life. The act requires the Group to submit a draft Basin Conservation Plan to the Secretary of the Interior within 2-1/2 years of its enactment. The Group started work on the plan in January 1996. Since this time, the Group met approximately every month and finally reached consensus on the plan as scheduled in April 1997. The process of consensus building was slow and arduous. There were times when it appeared the differences could not be overcome. The turning point occurred well into the process when several members rewrote controversial sections of the plan incorporating their own ideas. This moved the Group from conceptual discussion to negotiation and consensus building on language that would appear in the plan.

The plan is currently going through a 60-day public review process and should be published early in 1998. It will have broad public acceptance because of the process and should allow Reclamation to implement the Basin Conservation Program without having to overcome opposition.

When the water conservation projects are completed, two-thirds of the conserved water will be left in the Yakima River or its tributaries for improved instream flows, and one-third of the conserved water will be available to the irrigators to improve the reliability of the water supply. The program is strictly voluntary, and the costs are shared between the federal government (65 percent), state (17.5 percent), and local irrigators (17.5 percent). #

—Walt Fite, Area Manager, Upper Columbia Area Office, Bureau of Reclamation, Yakima, WA

(43 U.S.C. § 390jj). Plans are to include "definite goals, appropriate water conservation measures, and a time schedule for meeting the water conservation objectives." Reclamation has established a Water Conservation Field Services Program to provide technical and financial assistance to districts for implementing these plans. Funds are to be matched by local cost-share partners (Reclamation, 1997).

Project uses are directed and constrained by their authorizations and by federal contracts with the governing services to be provided (e.g., annual water deliveries), payments for their allocated portion of the construction costs, and payments (if any) for ongoing operation and maintenance, as well as other matters. As demands for water controlled and delivered through Reclamation facilities change, water uses have also been changing. Increasingly, these changes require some change in the contract or even in the project authorization—for example, when the project or the contract only authorizes irrigation water uses and the desired use is for nonirrigation purposes.

In 1988, Interior established policy for guiding transfers of federal project water to new uses (Interior, 1988; Reclamation, 1991). Generally supportive of such transactions, the policy limits federal review to such matters as whether there would be any diminution of service to other users, whether federal and state laws are met, and whether there will be adverse third-party consequences. Transfers had occurred with federal approval prior to institution of this policy (MacDonnell, 1991), but now there are generally known and accepted rules and procedures governing such transactions.

### ***The Army Corps of Engineers***

Like Reclamation, the Corps historically was primarily a construction agency; but today, both agencies spend more on O&M than construction. The Corps' work on western rivers has focused

almost entirely on construction and operation of dams for flood control, coupled in some locations with hydroelectric power generation and water supply. As is the case with Reclamation projects, the number of new Corps flood control projects authorized by the Congress has declined markedly in recent years. While Corps appropriations generally have increased over the years (in current dollars), the share going to construction of new projects has declined from more than 80 percent in the 1960s to about 40 percent in 1997. By 2002, total Corps appropriations are expected to decline 20 percent in constant dollars from 1997 levels (EOP Group, 1997).

The decline in Corps construction of new water projects reflects, in part, a changing view of flood management. In simple terms, the focus is shifting from controlling floods to managing flood plains. Thus, reliance on dams for holding back floodflows and on levees for keeping floods within channels is broadening to include such things as removing high-risk human uses of flood plains, floodproofing continuing human uses, and improving flood warning and temporary evacuation systems (Floyd, 1997). The 1994 edition of the *Unified National Program for Floodplain Management* lists four strategies:

- (1) Modify human susceptibility to flood damage and disruption
- (2) Modify the impact of flooding on individuals and communities
- (3) Modify flooding
- (4) Preserve and restore the natural resources and functions of flood plains

This broadening in emphasis to include nonstructural approaches increases the importance of local participation, including planning, land use management, and implementation. Reflecting the changing nature of flood damage management, the 1986 Water Resources Development Act included

## ***EPA's Watershed Protection Approach***

Despite great improvements in some water resources following implementation of environmental statutes and voluntary initiatives, many difficult and controversial water resource quality problems remain. Environmental statutes do not address, and in some cases specifically exempt, the most significant remaining sources of environmental quality pollution and degradation, including:

- Pollutants in runoff from urban and agricultural nonpoint sources.
- Groundwater leaching of pollutants from nonpoint sources and related surface water impacts.
- Losses of wetlands and their associated ecosystem benefits.
- Toxics and microbial contamination in communities' drinking water supplies.
- Water availability problems for both human and ecosystem uses institutions and incentive structures that make conservation difficult.
- Environmental laws and regulations that treat land, air, water, and living resources as separate entities.

### **What is EPA's Watershed Protection Approach?**

The watershed protection approach represents an effort to address the above problems by integrating EPA programs and all other tools available to protect and restore aquatic resources. The concept is to focus on hydrologically defined drainage basins—watersheds—as the areas of study, rather than areas defined by political or other boundaries.

The watershed protection approach identifies the primary threats to human and ecosystem health within a watershed; engages people most likely to be concerned or most able to take action in a watershed; and takes a comprehensive, integrated approach to solutions and actions. The ability to monitor progress and modify actions is also a cornerstone of the approach. The watershed approach emphasizes all aspects of water quality—physical, chemical, and biological—and encompasses all waters—surface, ground, inland, and coastal.

### **Building Capacity in Watersheds**

EPA's 10 regional offices work to implement watershed protection activities in partnership with state, tribal, and local governments; professional and other interest groups; landowners; and the general public. EPA has recognized that voluntary approaches are needed to protect water resources not adequately protected by environmental statutes. Numerous watershed protection tools are available, including workshops, indicators of water resource health, databases, financial assistance information, water quality and other models, data collection/measurement/assessment, outreach and education, and others.

### **Clark Fork-Pend Oreille Watershed**

The Clark Fork-Pend Oreille watershed covers 26,000 square miles in Montana, Idaho, and Washington. Congress initiated the project to address problems with nutrient overloading in lakes and rivers caused by runoff from irrigated agriculture fields, inadequate septic tank systems, municipal and industrial wastewater treatment plant, and heavy metals from active and inactive mining and smelting. Watershed protection actions were initiated (under Section 525 of the 1987 Clean Water Act) to conduct a comprehensive study of pollution sources in Pend Oreille Lake, the Pend Oreille River, and the Clark Fork River and its tributaries. The study involved the states of Montana, Washington, and Idaho; EPA Regions 8 and 10; and EPA's Las Vegas Environmental Monitoring Systems Laboratory. A study of Pend Oreille Lake was conducted by federal, state, and local government agencies. In all, participants included nearly 30 organized groups from federal, state, local, and tribal governments; private industry; and the local citizenry.

Project objectives include reducing nutrient loadings and controlling algae in the Clark Fork River, Pend Oreille River, and Pend Oreille Lake. Water quality problems include algal blooms and eutrophication of near-shore lake areas. Project objectives are being pursued by controlling land use activities that contribute to nonpoint and point source nutrient loading. EPA has provided funding and technical

(See "EPA," next page)

### ***EPA (continued)***

support for numerous projects in the watershed. Actions taken by the states and communities to control nutrient loadings of the rivers and lakes have included:

- A Tri-State Implementation Council to implement recommendations.
- A basinwide phosphate detergent ban.
- Numeric nutrient loading targets for the Clark Fork River, Pend Oreille River, and Pend Oreille Lake.
- Education programs for the public to help protect water quality.
- Eurasian milfoil (a noxious aquatic weed) control.
- Centralized sewer systems for developed areas on Pend Oreille Lake.
- Improvements at the Missoula wastewater treatment facility.
- Enforcement of regulations and laws, particularly state antidegradation statutes.
- A basinwide water quality monitoring network to assess effectiveness and trends and to better identify sources of pollutants.
- Development and enforcement of stormwater and erosion control plans and county ordinances.

Idaho received a Clean Lakes Program grant in 1987 for a Phase I diagnostic and feasibility study of Lake Pend Oreille and its watershed to analyze the lake's condition, examine sources of pollution, and evaluate solutions and recommendations to restore and protect lake water quality. In 1993, a Phase II Clean Water Lakes grant was awarded to take actions on Phase I recommendations, including in-lake restoration and watershed management activities to control nonpoint source pollution.

#### **Boulder Creek, Colorado**

The Boulder Creek Enhancement Project demonstrates a holistic approach to water quality

improvement and encompasses several aspects of the TMDL process. Although not formally submitted as a TMDL, the enhancement project closely parallels the phased TMDL approach outlined in the TMDL guidance (U.S. Environmental Protection Agency, 1991). Following identification of water quality impairment, all possible causes were examined, and the location and extent of controls necessary to correct the impairment were identified. An adaptive management plan was developed to implement the proposed controls in phases, a few at a time, to permit monitoring and evaluation of their effectiveness. The implementation plan was modified between phases based on the evaluations.

A use-attainability study, one of the first conducted in Colorado, showed that aquatic life in Boulder Creek was impaired. Traditional monitoring indicated that instream concentrations of unionized ammonia were exceeded downstream of the city's wastewater treatment plant (WWTP). Pollution contributions from each point source (the WWTP and other dischargers) and nonpoint source (agriculture, cattle grazing, surface mining, and water diversion) along the 15.5-mile stream section below the WWTP were evaluated and monitored to determine the most effective strategy for reducing the instream unionized ammonia concentrations and improving stream conditions. Data showed WWTP was meeting its effluent limits for ammonia, indicating either that (1) the effluent limits were not strict enough or (2) other factors were responsible for the impaired water quality of Boulder Creek.

Further investigation showed that high water temperature and pH were the primary causes of the unionized ammonia excursions. These were linked, in part, to physical degradation of the creek's riparian zone; species diversity and density were low even in reaches with good water quality. Therefore, more stringent effluent limits and plant upgrades alone would not solve the problem. A combination of plant upgrades, best management practices, and habitat restoration was needed to improve water quality in Boulder Creek. #

—Brad Crowder, U.S. EPA, Region VIII, Denver, CO

cost-sharing requirements for Corps flood control projects and flood control aspects of Reclamation projects. Previously, local sponsors had been required only to provide lands needed for Corps projects. The 1986 Act required local sponsors to pay for feasibility studies plus a share of the construction costs. The Act further increased the local share for project construction costs and required local sponsors to prepare and implement flood plain management plans within 1 year following project completion (Floyd, 1997).

### ***USDA Water Programs***

The 1954 Watershed Protection and Flood Prevention Act provided state and local government with up to 100 percent of the funding needed to construct flood control structures in "small" watersheds (250,000 acres or less) (USDA, 1997). According to USDA, 482 watershed projects involving flood control have been constructed in the 19 western states since 1954, including the construction of more than 3,000 flood control dams (USDA, 1997). Funding for these projects is expected to decline sharply, and no new projects are expected to get federal support except by specific congressional appropriation (EOP Group, 1997).

The USDA, through its Rural Utilities Service, operates loan and grant programs supporting provision of drinking water supplies and wastewater treatment in rural areas (less than 10,000 people). Nationwide, this program provided funding of \$1.3 billion in 1997 (USDA, 1997).

Through its extension service and NRCS, USDA provides research, demonstration, and information directed at improving onfarm irrigation practices (USDA, 1997). One well-known product funded through the extension service is the "Low Energy Precision Application" modification for center-pivot irrigation systems, which has improved irrigation water use efficiency while lowering energy costs.

### **Water-Related Environmental Protection**

Perhaps no area of federal programs has grown more rapidly since the 1960s than that related to environmental protection. As described earlier in this chapter and in chapter 4, the Congress enacted a broad array of laws during this period, making water quality and endangered species protection national priorities; directing that federal actions not impair, but rather enhance, environmental values (especially those related to fish and wildlife); and providing in other ways for environmental protection. This section discusses selected water-related environmental protection programs.

### ***Environmental Protection Agency Programs Under the Clean Water Act***

The Clean Water Act (CWA) declares that the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters is a national objective and sets out requirements that apply on a nationwide basis. Most prominently, it prohibits discharging any pollutant from a point source into the nation's waters except in compliance with a permit requiring technologically based, nationally established levels of treatment (33 U.S.C. §§ 1311, 1342). It requires water quality standards for all lakes and streams, setting out designated uses of the water and adopting water quality criteria supporting such uses (33 U.S.C. § 1313). It encourages voluntary approaches for dealing with nonpoint sources of pollution (33 U.S.C. § 1329).

EPA is given a number of direct responsibilities under the CWA. For example, EPA is required to establish national standards of performance for treatment of discharged pollutants (33 U.S.C. § 1316), more stringent treatment standards for discharges of toxic pollutants (33 U.S.C. § 1317), and minimum water quality criteria supporting designated water uses (33 U.S.C. § 1314).

As described above, states for the most part implement the Clean Water Act. Most states have assumed responsibility for administering the point source permit system. They have set water quality standards for their streams, assessed sources of nonpoint source pollution, and set up programs intended to reduce pollution from these sources. EPA acts primarily in an oversight capacity, assuring that state programs meet statutory and regulatory requirements.

In addition to its responsibilities related to establishing national standards and criteria and overseeing state implementation activities, EPA manages the distribution of congressionally authorized funding to help meet the objectives of the CWA. Most significantly, the federal government has funded more than \$66 billion in grants to construct municipal treatment plants since 1972 (EOP Group, 1997). Between 1974-87, the program involved a 75/25 match, with funding going to specific projects prioritized by states and approved by EPA. At this point the program moved to a State Revolving Fund, with federal funds going as grants to the states to be disbursed for waste treatment or treatment-related programs beyond municipal waste treatment construction. In fiscal year 1995, Congress appropriated \$1.235 billion for EPA distribution to the Clean Water Act State Revolving Fund—of which about \$350 million went to the 19 western states (EPA, 1996). Federal funding for water pollution abatement soon is expected to exceed that for other kinds of water resources programs (EOP Group, 1997).

Next in importance, based on funding, is the EPA program for water quality research. In fiscal year 1995, \$545 million went to support development and analysis of data and technologies specific to protecting designated uses of water. About \$100 million went to grants under section 319 to support implementation of nonpoint source management programs, of which roughly \$17 million went to the western states. Seventy-nine million went to

section 106 grants, used by states and tribes to establish and maintain measures to prevent and control surface water and groundwater pollution, of which about \$19 million went to western states.

### ***USDA Conservation Programs***

With the 1985 Food Security Act, the Congress greatly increased the emphasis on environmental protection in USDA conservation programs. Following in part the model of the 1970 Water Bank Program, the Congress initiated the Conservation Reserve Program and the Wetlands Reserve Program. The Conservation Reserve Program provides funds to pay an annual rental to farm owners and half the cost of establishing a permanent land cover such as grass or trees in return for retiring cropland from agricultural use for 10 to 15 years (USDA, 1997). The Wetlands Reserve Program provides funds to pay landowners to retire areas with significant wetland values from farming uses for specified time periods.

The 1990 Food, Agriculture, Conservation and Trade Act established the Water Quality Incentives Program to help fund farm practices that reduce nonpoint source pollution. The incentive program provided payments to farmers who agreed to implement approved management practices for 3- to 5-year periods. This program now has been subsumed within the Environmental Quality Incentives Program described below. USDA also established the Water Quality Program in 1990 to focus technical and financial assistance on areas with identified agricultural-related water quality problems.

The 1996 Farm Act established the Environmental Quality Incentives Program, consolidating the functions of the Agricultural Conservation Program, the Water Quality Incentives Program, the Great Plains Conservation Program, and the onfarm

## ***Chalk Creek Watershed: Reducing Erosion and Sedimentation of Streams***

The Chalk Creek watershed in northeastern Utah covers 176,000 acres and is used primarily for livestock, wildlife production, hunting, fishing, oil and gas production, timber harvest, and recreation. Chalk Creek is a major tributary to the Weber River, which provides the water supply for the cities of Ogden, Roy, and Layton. These downstream water users experience serious taste and odor problems during the spring and fall lake overturns at Echo Reservoir, and they also experience unusually high water treatment costs.

In 1991 the Summit County Soil Conservation District initiated the Coordinated Resources Management Plan (CRMP) process. A Steering Committee and Technical Action Committee were formed to identify watershed problems, seek solutions, and put together a CRMP.

Of the several pollution problems identified, sediment loading is most serious. Studies found that Chalk Creek, a major tributary to the Weber River, exceeded by 10 times the sediment contribution of any other tributary, resulting in severe eutrophication and excess nutrient loading of Echo Lake and the Weber River.

Causes of Chalk Creek water quality problems were identified as overgrazing by livestock and wildlife causing range erosion, heavy livestock concentrations along the riparian corridor, and indiscriminate creek spraying for weed control, destroying deep rooted shrubs necessary for healthy streambanks and a functional riparian flood plain. Most of the sediment flowing from Chalk Creek comes directly from the streambed or its banks. Heavy oil and gas exploration activities, and the related road construction, also contributed to sediment loading. Overirrigation has also contributed to nutrient loading to Chalk Creek. Not only are nutrients leached from the soils, but irrigation return flows flow directly into Chalk Creek, carrying sediment, animal waste, pesticides, and nutrients.

The CRMP sets forth selected treatment alternatives. Plans for the uplands include range seeding, sagebrush control, juniper removal, gully plugs, improved grazing management, creating functioning

alluvial fans and wetlands for sediment filtration, protecting oil and gas activities from excessive erosion, and developing offstream water source for livestock and wildlife. Plans for the riparian areas include streambank protection, grade stabilization, riparian revegetation and protection, corridor and/or riparian pasture fencing, and improved grazing management. Plans for the irrigated pasture and hayland in the lower watershed include installation of a communitywide gravity flow sprinkler irrigation system to replace present flood irrigation systems and subsequent improved irrigation water management. Plans for the scattered irrigated lands in the upper watershed include improvement of existing diversion structures, improved irrigation water management, and sprinkler irrigation systems wherever practical.

The expected benefits will be range and forest protection, riparian restoration, wildlife enhancement, improved trout fishing, decreased sediment delivery to Echo Reservoir and the lower Weber River system, slower eutrophication in Echo Lake, and reduced water treatment costs for downstream water users. If these goals are met, it is expected that Chalk Creek will meet Utah Water Quality Standards for its designated use.

To date, approximately one-fourth of the area has been treated using \$400,000 in contributions from a variety of sources including EPA's 319 nonpoint source fund, Agriculture Conservation Program, Stewardship Incentive Program, the Service's Partners for Wildlife fund, the Utah Division of Wildlife Habitat fund, the Utah Division of Oil, Gas and Mining bond reclamation fund, the National Fish and Wildlife Foundation, Questar Pipeline, and other considerable private sources.

Projects completed include brush control, range seeding, fencing and grazing management for the range, riparian pastures and riparian corridors, spring development, stockwater lines, troughs, ponds, water gaps, channel revegetation, deferred grazing, grazing rotation, stream stabilization using vortex weirs, streambank protection using stream barbs, conifer revegetment, and biotechniques using willow fascines and blankets and several sprinkler irrigation systems. #

portion of the Colorado River Basin Salinity Program. Farmers and ranchers who adopt practices determined to reduce environmental and resource problems over a 5- to 10-year period receive technical assistance, education, cost sharing (up to 75 percent), and incentive payments.

Not only has the USDA shifted its conservation program emphasis from soil conservation to environmental protection, but it also has shifted emphasis within its programs from technical assistance and support of public works to cropland retirement through rental and easement payment and incentive payments to adopt environmentally protective agricultural practices. In short, it is paying farmers and ranchers to make environmentally desirable changes.

Appropriations for USDA conservation programs steadily increased in current dollar terms until 1995, when budget tightening reversed that trend. The mix of program expenditures has shifted to reflect increased emphasis on the use of direct payments to farmers instead of support for public works or cost sharing onfarm improvements. Since 1988, rental payments for retired lands—virtually all for the Conservation Reserve Program—account for the largest share of USDA conservation expenditures (USDA, 1997).

### ***Implementation of the Endangered Species Act***

The ESA represents a national commitment to protect plant and animal species threatened with extinction. It requires federal agencies to insure that their actions are not likely to jeopardize the continued existence of such species or to result in the adverse modification of their critical habitat (16 U.S.C. § 1536(a)(2)). It makes it unlawful for any person to harm or destroy an endangered species of fish or wildlife (16 U.S.C. § 1538 (a)(1)(B)).

Under the ESA, the Fish and Wildlife Service and, for marine species, the National Marine Fisheries Service (NMFS) are given a number of specific responsibilities. First, they are to identify and list plant and animal species determined to be either threatened or endangered and identify their critical habitat (16 U.S.C. § 1533). Second, they are to develop and implement plans for the recovery of listed species (16 U.S.C. § 1533(f)). Third, they act as consultants to other federal agencies in evaluating whether their proposed actions are likely to further jeopardize a protected species (16 U.S.C. § 1536). Finally, in the event of a "jeopardy" finding, they suggest reasonable and prudent alternatives.

Native fish species are in danger of extinction in all of the major river basins of the West as reflected in the basin studies prepared for the Commission. The development and use of western rivers that has accompanied settlement and development of the region have been a major factor in the decline of these species. Proposals for additional water development face review under ESA for their impacts on protected aquatic species. However, predictions by some that ESA would prevent any new water development and reduce yields from existing projects have proved largely unfounded. Since passage of the ESA, the Service has reviewed nearly 100,000 proposed federal actions for possible harm to protected species. Fewer than 1 percent of those actions have been found to involve unavoidable jeopardy (Service, 1997); in nearly all cases, either no jeopardy was found or reasonable and prudent alternatives were identified that would avoid further harm to protected species.

One of the more striking developments related to western water since the 1970s is the emergence of multiparty efforts to deal with endangered fish problems. In some cases, these efforts are connected to recovery plans under ESA. In other cases, they are proceeding as habitat conservation



## ***Water Conservation in Agriculture***

As the largest consumer of water in the West, the agricultural sector's water use practices are always under scrutiny. Growing demands for municipal and environmental water, coupled with the federal subsidy of irrigation water supplies, fuels the common perception that agriculture should use water more efficiently. There is no doubt that, in some areas, the abundant supply of cheap water has encouraged overapplication of water to crops and has discouraged investment in conservation improvements. However, irrigated agriculture as a whole has been responding to the increasing economic, regulatory, and social pressures toward more efficient water use.

The U.S. Department of Agriculture data indicate that irrigators nationally have reduced rates of application to crops by almost 20 percent from the late 1960s to 1994. In the West, between 1982-92, 6.2 million acres of farmland were brought under improved irrigation conservation practices. A 1994 survey of western irrigators found that more than one-third of farm operations undertook recent improvements in their irrigation systems, reducing water requirements on 68 percent, and energy consumption on 50 percent, of their acres. From 1976-93, acreage with surface irrigation systems decreased from about 37 to 26.6 million. Sprinkler irrigation was installed on approximately 6 million acres, and microirrigation systems, including drip irrigation, increased from 150,000 to 1.6 million acres. Even though the number of irrigated acres nationally has remained stable, the value of crop sales from these acres has risen from 30 to 41 percent total sales since 1982—reflecting, in part, improved water use efficiency.

The most commonly cited obstacles to improved irrigation systems are installation costs and inability to obtain financing.

While much discussion of agricultural water conservation occurs in the context of obtaining more water for other uses, such as instream flows, major benefits of increased efficiency are more reliable supply for farmers with junior water rights and improved crop production per acre. Institutionally, the challenges for agriculture are to implement water metering and institute more progressive water rate structures that reward water use efficiency. #

plans under the statutory provision relating to incidental taking of a species in the course of an otherwise lawful activity.

The Upper Colorado River Recovery Implementation Plan, in place since 1988, seeks to recover four species of fish native to the Colorado River and listed by the Service as in danger of extinction. Large-scale water development in the Colorado River basin is acknowledged to have been a major factor in the decline of these species. Plan implementation is overseen by a voluntary partnership involving federal agencies (Service, Reclamation, and Western Area Power Administration), the three Upper Basin states (Colorado, Utah, and Wyoming), a water development coalition, an environmental coalition, and an entity representing public power interests receiving hydroelectric power generated at facilities in the basin (the Colorado River Energy Distributor's Association). Recovery efforts focus primarily on habitat improvement and restoration and fish rearing and stocking. Roughly 90 percent of the funding comes out of Reclamation and Service budgets, with the states and the water developers providing the remainder. The Service regards continuing progress under the plan as sufficient basis for allowing additional water development in the Upper Basin. As of 1997, the Service had consulted on proposed federal agency actions involving more than 400 water projects that would develop more than 225,000 acre-feet of water in the Upper Basin and had supported their approval in every case because of progress under the Recovery Plan (Kantola, written communication, 1997).

Parties in the Lower Colorado River basin are in the process of putting in place a Multi-Species Conservation Plan. The partnership involves the three Lower Basin states (Arizona, California, and Nevada), water and power user interests within these states, six federal agencies (Service, Reclamation, BLM, National Park Service, BIA, and the

U.S. Geological Survey), Indian tribes and nations, environmental organizations, and others. The plan's goal is to establish a 50-year program to conserve necessary habitat and aid recovery of rare, threatened, and endangered plant and animal species native to the Lower Colorado River and its 100-year flood plain.

Still another approach is represented by the CALFED Bay-Delta Program. Multiple environmental problems, including the presence of endangered fish, limit water use from California's major source of supply. The CALFED program, initiated in 1995, involves 12 federal and state agencies working with an advisory council of 34 water leaders. The initial focus is on identifying a mix of actions acceptable to these interests that will successfully address the major environmental problems of the Bay-Delta. In 1996, the Congress authorized funding of \$3.3 million per year for 3 years to support this program.

### ***The Army Corps of Engineers Civil Works Program***

Since 1986, the Congress has been moving the Corps' traditional engineering mission in the direction of environmental improvements, creating what has been referred to as the "Corps of Environmental Engineers" (Grumbles and Kopocis, 1993). The 1986 Water Resources Development Act declares that the benefits of environmental improvements accomplished by the Corps as part of its projects are to be regarded as equal to their costs (making their justification automatic) and specifically provides mitigation measures for fish and wildlife for Corps projects (§§ 907 & 906). Moreover, it provides authority to the Corps to revisit existing projects to evaluate and make changes that will improve the environment (§ 1135). The 1990 Water Resources Development Act established environmental protection as a primary mission of the Corps (§ 306(a)).

## Water for Wildlife Refuges

The National Wildlife Refuge System will soon be celebrating its 100th birthday. In 1903, public outrage over the devastation of wading bird populations in Florida led President Theodore Roosevelt to create the first refuge, Pelican Island Federal Bird Reservation. By the time he left office in 1909, President Roosevelt had established wildlife reservations in 17 states and 3 territories. Today there are over 500 Federal Wildlife Refuges encompassing more than 92 million acres of land. The refuge system is managed by the Service.

Virtually every species of bird in North America has been recorded in the refuge system, but the wide diversity of refuge wildlife also includes hundreds of other species of mammals, reptiles, amphibians, fish, and plants, including over 60 endangered species. In Alaska, the refuge system includes entire river basins and ecosystems. In Hawaii, the refuge system includes wetlands and remote islands which provide habitat for a vast array of water birds and marine life. The prairie pothole regions in Minnesota, the Dakotas, and Montana encompass hundreds of thousands of potholes, lakes, and marshes that are vitally important as waterfowl breeding areas. This area, which extends into Canada, can produce a fall flight of over 25 million migratory waterfowl. The deserts, prairies, mountains, and coastal wetlands of the West and Southwest provide habitat for big game, marine mammals, and shorebirds, as well as waterfowl. In the West, some refuges were established as game ranges or to protect endangered species, but the vast majority were created to protect migratory birds and fulfill the international migratory bird treaty obligations of the United States. Most of these waterfowl refuges are located along the Central and Pacific flyways (major north-south waterfowl migration routes) and provide critical feeding and resting areas during the spring and fall migrations.

Approximately one-third of the refuge system acreage is wetland habitat, reflecting the important value of wetlands for wildlife and the continuing threats to this diminishing resource. The majority of this acreage is not manipulated in any way. However, about 1.6 million acres of wetlands are actively managed. Wetland or flood plain ecosystems historically maintained by periodic river flooding and wet climatic conditions,

prior to flood control and channelization, can now be maintained only through active water management. Refuge managers divert water to maintain marshes and impoundments, create moist soil units, irrigate nesting cover or grain crops, and sustain streamflows for fisheries and riparian habitat. Water level manipulation to mirror natural processes is used to aerate soils and stimulate plant growth. Refuge wetland restoration and, in some cases, creation of new wetland habitats, has become increasingly important in the effort to stem the continuing decline of wetlands nationwide.

Adequate and reliable high quality water supplies, and the legal rights to use that water, are critical if refuges are to fill their wildlife objectives. Given the relatively late establishment dates of most refuges, the U.S. Fish and Wildlife Service faces major challenges in protecting sufficient water to meet resource management objectives, statutory responsibilities, and international treaty obligations. Of 226 western refuges responding to a 1994 questionnaire, only 98 reported that their existing water rights assured delivery of adequate water in an average year.

One difficulty encountered by the Service in protecting refuge water resources is that *in situ* uses of water, such as natural marsh/wetland areas or instream flows, cannot be protected under the laws of several western states. Without a water right, the Service lacks standing, except under a broad public interest criteria, to protest projects which drain or dewater refuge water sources.

A second problem stems from the lack of funds to adequately document water uses on many refuges. Additional funds are necessary if the Service is to move its water rights management program beyond its current reactive mode to a planned hydrological and biological data collection program. A proactive program would improve data collection and analysis for use in defense of refuge water rights; increase the efficiency and effectiveness of existing water management; and enhance the Service's ability to form partnerships, work with other entities on watershed-based solutions to achieve wildlife objectives, and resolve water resource needs. #

Under its authority to make modifications to existing projects for environmental benefits, the Corps has:

- Made changes at Boyer Chute, Nebraska, to restore seasonal flows in an oxbow to restore fish habitat.
- Improved wetlands at Fern Ridge Lake, Oregon.
- Increased waterfowl nesting habitat at Homme Lake, North Dakota.
- Restored salmon access to the Sammanish River, Washington.
- Restored the direct hydraulic connection between an intertidal area and the estuary at Trestle Bay, Oregon.
- Restored historic wetlands at Davis Site, California (Martin, 1997).

In connection with new flood control projects, the Corps has restored aquatic and riparian habitat and channel integrity in Rapid Creek, South Dakota, and has studied ecosystem restoration opportunities at Jackson Hole, Wyoming (Martin, 1997).

Arising out of individually authorized ecosystem restoration studies, the Corps has:

- Evaluated the feasibility of modifying its Cougar and Blue River Lakes projects in Oregon to make available water at temperatures favorable to anadromous and other native fish.
- Evaluated the feasibility of improving stream channel and riparian habitat to benefit the cui-ui and the Lahontan cutthroat trout in the Lower Truckee River, Nevada.

- Examined the potential for wetland and riparian vegetation restoration within an existing urban flood control channel in Rio Salado, Arizona.
- Evaluated restoration of tidally influenced wetlands in the Sacramento-San Joaquin Delta, California (Martin, 1997).

### ***The Bureau of Reclamation and Environmental Protection***

Like the Corps, Reclamation increasingly finds itself concerned with matters of environmental protection. In the 1974 Colorado River Basin Salinity Control Act, the Congress gave Reclamation major responsibility for dealing with salinity concerns in the Colorado River (43 U.S.C. § 1592 et seq.). First, it directed Reclamation to construct a large desalting facility on the Colorado River near the Mexican border at Yuma, Arizona, capable of treating river water to ensure its salinity content meets the levels agreed to with Mexico. Second, Reclamation has constructed salinity control units at several locations in the basin to reduce salinity loadings to the river.

Reclamation has been making structural changes and modifying operation of many of its facilities over the years to mitigate adverse environmental effects or provide increased environmental and recreational benefits (numerous examples are discussed in a 1996 report produced by the Natural Resources Law Center [1996]). In some cases, these changes have been made under specific authority and direction from the Congress; in other cases, Reclamation has made the changes on its own authority to meet local needs and interests or to respond to its obligations under NEPA or the ESA.

The shift in emphasis from project construction for water development to environmental protection is dramatically reflected in the Reclamation Projects

## *National Fish and Wildlife Foundation*

From "Bring Back the Natives" and "Partners in Flight" to Hungry Horse Reservoir Fish Passage, Upper Blackfoot River Restoration, Boulder City Wetlands, Algodone Dune Watchable Wildlife, and hundreds more projects—small and large and all across the United States—the National Fish and Wildlife Foundation (Foundation) is making a significant contribution toward protecting and restoring fish, wildlife, plants, and their habitats.

The Congress chartered the Foundation in 1984 as a charitable and nonprofit corporation. It is not an agency of the U.S. government but is authorized to receive federally appropriated funds. Its mission is to aid in achieving the mission of the U.S. Fish and Wildlife Service through public-private partnerships. The Foundation's unique status has allowed it to pioneer innovative funding mechanisms; to build private, public, and governmental relationships many would have thought impossible. It has funded and fostered a "bottom-up, hands-on" approach to protecting and restoring natural resources and had many successes.

The Foundation's role is primarily one of facilitating promising projects: it raises funds to provide grants or "seed" money to the projects, brings other partners into the projects if appropriate, and provides technical assistance. With greater competition for shrinking federal dollars for conservation projects, the Foundation has been able to harness funds from a variety of sources for local projects. It meets needs that might otherwise be overlooked or not funded by governmental programs.

Part of the success of the Foundation can be seen by looking at their financial history. The Congress required the Foundation to match the funds they receive from the Congress on a minimum one-to-one basis. All of the Foundation administrative costs must come from private sources. Over the years, the congressional contribution to the Foundation has been relatively small, beginning with \$250,000 in 1987 and gradually increasing to \$15.9 million in 1997. Due in large part to its ability to get things quickly with minimal red tape, the Foundation has attracted broad and diverse sources of funds. More federal agencies contribute to Foundation programs today than in earlier years, and the total dollar amount from those agencies has increased from \$250,000 in 1987 to \$16,171,000 in 1996. A similar dramatic increase in funds from private sources has occurred with \$580,000 in 1987 increasing to \$27.6 million in 1996.

As policymakers and others seek to meet environmental protection and restoration needs under increasingly challenging circumstances, the Foundation's experiences provides useful lessons on the importance of building private-public sector relationships, the need for leveraging diverse sources of funds, and the importance of producing on-the-ground results quickly. #

Authorization and Adjustment Act of 1992 (P.L. 102-575). This Act contains 40 separate titles related to water resources projects and other western water matters. Nine of these titles deal largely or totally with environmental concerns. Title 34, the Central Valley Project Improvement Act, is characterized by Reclamation as "a major aquatic ecosystem protection and restoration program" (Reclamation, 1997). Perhaps its most important provisions are the dedication of 800,000 feet of project yield to fish, wildlife, and habitat restoration purposes (1992 Reclamation Projects Act, § 3406(b)(2)) and the requirement of a plan for doubling existing populations of anadromous fish in Central Valley streams and rivers by the year 2002 (Id., § 3406(1)). Title 3 is a companion to the title authorizing completion of the Central Utah Project. It provides for creation of the Utah Reclamation Mitigation and Conservation Commission, with responsibility for coordinating implementation of environmental mitigation projects spelled out in the act (Id., § 301(a); § 315).

In the Pacific Northwest Region, the major Reclamation initiative related to environmental protection concerns flow augmentation in the Columbia/Snake River system to benefit endangered stocks of salmon. Annually since 1991, Reclamation has provided water for this purpose from its facilities—primarily from uncontracted reservoir storage space, storage space reserved for power generation, and annual purchase of water available from rental pools (Reclamation, 1997). As of 1997, Reclamation had purchased about 57,000 acre-feet of storage space from which it can now deliver water, and the agency is acquiring additional direct flow rights. Funding directed to flow augmentation efforts in fiscal year 1997 totaled \$6.75 million. Other major initiatives include construction of a project pumping water out of the Columbia River into the Umatilla River to help restore salmon spawning access and making improvements to the Yakima Project and to water

uses within the basin to improve instream flows needed by salmon and other anadromous fish.

Environmentally related Reclamation efforts in the Great Plains Region focus primarily on wetlands. In 1989 the Great Plains Region initiated the Wetlands Development Program. Fiscal year 1997 funding for this program was \$4.489 million supporting 53 projects. In addition, as mitigation for the Garrison Diversion Unit, Reclamation has purchased approximately 6,180 acres of wetlands, restoring some previously drained lands. Additional adjacent uplands also have been acquired and planted to permanent cover.

In the Lower Colorado Region, Reclamation has focused largely on endangered species concerns—primarily relating to the endangered razorback sucker and the bonytail chub. These efforts are folding into the Multi-Species Conservation Program, intended to address the habitat and other needs of more than 100 species.

As already mentioned, in the Upper Colorado Region, Reclamation is a major participant in the Upper Colorado River Recovery Program—providing \$10.3 million in funding in fiscal year 1997. The other major Reclamation initiative in the Upper Colorado Region involves reoperation of Glen Canyon Dam; following years of study under an environmental impact statement process, dam operations were changed to improve downstream environmental conditions in the Grand Canyon. Moreover, experimentation with controlled flood releases began in 1996 to evaluate the benefits of periodic large-flow releases.

Ecological restoration activities initiated under the 1992 Central Valley Project Improvement Act dominate Reclamation's environmental protection efforts in the Mid-Pacific Region. Funding for these activities in fiscal year 1997 was \$58.3 million. In addition, Reclamation provides substantial funding in support of the Trinity River Fish and Wildlife

Restoration Program (\$5 million in fiscal year 1997) and the CALFED Bay-Delta Program (\$4.1 million in fiscal year 1997). A temperature control structure at Shasta Dam on the Sacramento River to provide late summer and fall water releases at temperatures beneficial to winter run chinook salmon spawning was installed at a cost of \$80 million.

### ***The Federal Energy Regulatory Commission and Hydropower Licenses***

The Congress established the Federal Power Commission (now the Federal Energy Regulatory Commission) in 1920 to allow private development of hydropower facilities in a manner that would maximize the potential for water power development (Act of June 10, 1920, ch. 285, 41 Stat. 1063). It required all such proposed facilities to obtain a license from FERC by demonstrating that the proposed project would promote comprehensive development of the river on which it is located (16 U.S.C. § 797(e); 16 U.S.C. § 803(a)). However, in 1986, the Congress directed FERC to give equal consideration to fish, wildlife, recreation, and other uses along with power development, in its licensing decision (P.L. 99-495, 16 U.S.C. § 803(a)). FERC is required to consult with federal, state, and local resource agencies in its consideration process and to include federal and state fish and wildlife agency recommendations for fish and wildlife resources in a license unless it finds such recommendations inconsistent with the purposes and requirements of the Federal Power Act (FPA) or other applicable laws. FERC is also required to include federal agency requirements in licenses for the adequate protection and utilization of federal reservation lands occupied by a project and for fish passage. Under NEPA, FERC is obligated to prepare an environmental impact statement or an environmental assessment to examine the environmental consequences of the project.

While FERC typically issues licenses for 30- to 50-year periods, hundreds of licenses have expired or will soon do so. Licensees seeking a new license file a notice with FERC 5 years in advance of license expiration and prepare information for public review respecting their relicensing plans.

They consult with federal and state resource agencies and Indian tribes respecting measures for resource protection, mitigation, and enhancement, and they conduct studies needed to support license application (National Park Service and American Rivers, 1996). FERC may initiate formal environmental review under NEPA for licensees seeking new licenses until the application is regarded as complete, although there is a trend to initiate environmental review earlier in the process under new authorities provided as part of the Energy Policy Act of 1992. Under section 4(e) of the FPA, after FERC finds that the license will not interfere or be inconsistent with the purpose of the federal reservation, the license conditions necessary for the adequate protection and utilization of the reservation may be prescribed. Under the FPA, the Secretaries of Interior and Commerce may prescribe fishways.

In addition, under section 10(j) of the FPA, FERC is required to include conditions that adequately and equitably protect, mitigate damages to, and enhance fish and wildlife. Those conditions are to be based on recommendations of the NMFS, the Service, and state fish and wildlife agencies. If FERC believes a § 10(j) recommendation or a part of the recommendation is inconsistent with the FPA or other law, FERC must attempt to resolve such inconsistency. If any part of such agency recommendation is not approved by FERC, FERC must make a finding of inconsistency. FERC license decisions may be appealed either by the applicant or by an intervening party to a federal court of appeals.

As a quasijudicial commission, FERC proceedings operate according to formal, court-like rules and requirements. The limited flexibility in these

proceedings, coupled with the reluctance of FERC to have to decide complex environmental matters, has encouraged use of settlement processes outside the formal FERC proceeding. FERC itself encourages applicants and other parties to agree to terms and conditions which can then go through the NEPA process. License terms and conditions have included such things as instream flows for boating and for fisheries, changes in reservoir operations, facilities for fish passage, watershed and river channel improvements, and the creation of trust funds for decommissioning or other purposes.

## **Water for Indian Nations and Tribes**

As noted in earlier sections, Indian nations and tribes have become major participants in western water matters during the past 30 years. While the process of specifically defining tribal water uses under their rights has proceeded slowly, the existence of these rights is firmly established. Courts have found that a tribe's *Winters* rights may include uses other than irrigation.<sup>3</sup> Courts also have found that tribal rights may even predate establishment of the reservation, based on pre-existing uses.

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<sup>3</sup> In *United States v. Adair*, 723 F. 2d 1394 (9th Cir.), *cert. denied*, 467 U.S. 1252 (1985), the Ninth Circuit held that the Klamath Tribe's treaty intended to reserve water necessary to support the hunting and fishing activities relied on by the tribe. The Ninth Circuit also upheld the existence of a reserved right to support the fishery on the Colville Reservation (*Colville Confederated Tribes v. Walton*, 752 F.2d 397 (9th Cir. 1985)). Also, the Washington Supreme Court upheld a decision in the Yakima River adjudication, finding a reserved water right for "the minimum instream flow necessary to maintain anadromous fish in the [Yakima] river, according to annual prevailing conditions" (*State Dep't of Ecology v. Yakima Reservation Irrigation District*, 850 P.2d 1306 (Wash. 1993)). The Wyoming adjudication, on the other hand, found that the Wind River Tribes could not claim reserved rights on the basis of fisheries maintenance.

However, much has been done since 1963 to further clarify the nature of tribal reserved water rights and to integrate these rights with other water rights established under state law. Procedurally, the U.S. Supreme Court has decided that quantification of tribal rights generally may be determined in state adjudication proceedings rather than in federal courts.<sup>4</sup> State courts must follow federal law in determining the existence and extent of tribal water rights. Few tribal reserved rights have yet made their way completely through such proceedings, though tribal rights are under consideration in a large number of river adjudications around the West (Burton, 1991). As noted heretofore, negotiations also have been used to produce settlements that define and quantify Indian reserved water rights.

Federal efforts to build facilities necessary for tribal on-reservation water uses have increased somewhat since the 1960s. As, for example, with the Navajo Indian Irrigation Project, Reclamation generally is responsible for planning and building the primary water storage and delivery facilities, and BIA is responsible for the on-reservation and onfarm facilities. Tribes in Arizona are important beneficiaries of the Central Arizona Project. Water from the Dolores Project in southwest Colorado is delivered by pipeline to the Ute Mountain Ute Reservation. The Mni Wiconi Project, authorized by the Congress in 1988, provides water for tribal municipal and industrial uses in South Dakota. Some tribes are taking advantage of special funding and technical assistance provided by Reclamation for feasibility studies of municipal, rural, and industrial water projects.

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<sup>4</sup> *Arizona v. San Carlos Apache Tribe of Arizona*, 463 U.S. 565 (1983). The Court's conclusion was that, by the 1952 McCarran Amendment, the Congress decided that federal claims held on behalf of Indian tribes to use water may be determined in state general adjudication processes. It concluded that tribal reserved rights had been included.



Some tribes now operate their own water quality program under Section 518 of the Clean Water Act, which authorizes EPA to treat tribes as states for such purposes (33 U.S.C. § 1377).

### **Contemporary Federal Involvement in Western Water: Summary and Assessment**

As this brief review of selected federal water-related policies and programs shows, the federal role in western water has changed quite markedly in the last 30 years. Historic types of water development are no longer its primary objective. Federal agencies are now trying to balance water development, project operations, and many environmental statutes such as NEPA, ESA, and the CWA.

#### ***Sustainability***

In actual practice, federal policies and programs related to western water present a far from coherent and integrated approach to sustainable water use. Indeed, nowhere is sustainability even articulated as an objective of federal water policy. Rather, what has happened over a roughly 30- to 40-year period is the piecemeal emergence of policies directed at water quality, endangered species, fish and wildlife enhancement, and preservation of land and water, coupled with a de facto decline in the authorization of new water development projects. Less visible but equally important has been the shift in using federal funds from primarily development-oriented purposes to a rough balance between support of development and support of environmental protection, enhancement, and restoration. New agencies have emerged to carry out some of these policies, and the missions of existing agencies have changed, either explicitly or implicitly.

Nevertheless, federal policies in this area remain contradictory in some respects—incomplete and

largely unintegrated. In many instances, federal water facilities continue to provide water and electricity to users below the actual costs of those services. An inevitable effect of below-cost pricing of any valuable service is to encourage its overuse—hardly the road to sustainability. Some efforts are being made to change the terms and conditions of contracts with project beneficiaries, particularly at the time that contracts are renewed. For example, under Title XXXIV of the 1992 Reclamation Projects Act, the Congress limited renewal of contracts for water supply from the Central Valley Project to no more than 25 years, required tiered pricing and the installation of water metering as conditions of renewal, imposed an annual "mitigation and restoration" payment, and conditioned transfers on the new user paying full costs of service. Water districts are being encouraged to use tiered pricing for water deliveries as a way to influence water use. Consideration is being given to defederalizing at least some federal water and power facilities so that federal support no longer will be available.

Federal support for new water projects has declined but not disappeared. Even though cost-sharing requirements for most new projects are considerably greater than in the past, federal support remains extremely attractive if project proponents can successfully navigate the political process.

#### ***Environmental Issues***

The promise of the Clean Water Act—to restore and maintain the chemical, physical, and biological integrity of the nation's waters—remains unfulfilled. Its regulatory structure has largely controlled the discharge of pollutants from point sources. Increasingly, the focus has turned toward meeting water quality standards that have been established for all surface water bodies; meeting existing standards will require reductions in pollution from

nonpoint sources beyond those obtained through the voluntary programs and activities employed to date.

Even more challenging in some respects is the federal commitment to protection and recovery of threatened and endangered species. Thousands of proposed federal actions now have gone through ESA-Section 7 review, with remarkably few found to produce unavoidable jeopardy. Development activities following reasonable and prudent alternatives developed under ESA-Section 7 or implementing habitat conservation plans are being guided in ways that are believed to be not only protective of endangered species, but also of help in their recovery. Nevertheless, scientific understanding of species' needs lags far behind protection efforts. In the case of aquatic species, the alteration of western rivers has so changed habitat conditions relied on by native species that feasible measures necessary for their recovery remain uncertain. It is fair to say that the mandates of the ESA are driving sometimes dramatic changes in river management throughout the West, changes intended to find a balance between rivers' developed uses and their natural functions.

### ***Tribal Issues***

Considerable progress has been made since 1963 in defining tribal rights to water. Far less progress has been made in tribal enjoyment of the benefits of those rights. With the reduction in new federal water projects, tribes have been unable to look to this avenue for satisfying their rights, although, as noted, negotiated settlements of tribal water rights have been used successfully in several cases. Also, off-reservation leasing of tribal rights, except under specific conditions, remains contentious. In short, the manner in which tribes can and will use their reserved water remains uncertain.

### ***Changing Roles***

The process of major change is rarely smooth and elegant, and certainly that is true in western water issues. Much effort and energy have gone into developing the many new federal programs instituted by the Congress since the 1960s, into clarifying through regulation and litigation the intention and reach of some of the provisions, and into making them workable on the ground. In some cases, advocates of the changes remain unsatisfied and work aggressively to broaden and strengthen federal programs. On the other hand, those whose activities are most directly affected by new federal programs have tended to resist their implementation and to seek changes in laws reducing what they regard as their most onerous impacts. Moreover, those who have been the historical primary beneficiaries of federal programs have tended to resist changes that reduce their traditional benefits or increase their costs. In addition, laws such as CWA substantially shifted the balance of federalism by establishing specific, nationally established requirements that the states were expected to implement.

Some of the measurable effects, viewed as both positive and negative, of the changing federal role are the decline in the number and size of new federal water projects, the increasing cost of these projects to their beneficiaries, the decline of pollution added to streams through point source discharges, the increase in the cropland acreage taken out of production, and the increase in the number of federal river restoration projects. In many respects, however, the most striking effect of federal changes is reflected, not by such measures, but by the emergence of efforts across the West to integrate a far broader and more complex set of interests into the governance of western waters.

When the dominant objective was water development for economic use and human consumption, water matters were almost exclusively the province of those with legal rights to divert and use water (typically a water district), the state

engineer who administered the state water rights system, and—if a federal water project was involved—Reclamation or the Corps. If the project involved hydropower generation, then those interests would be involved as well. Then-Governor Bruce Babbitt nicely summed up this relationship in a 1990 speech to the Western States Water Council:

*That was an era in which most Governors and citizens of these western states did not have anything to do with [federal] water development. It was handled in Washington, with the assistance of the state engineer. It was a federal issue, and local folks did not mess around with it. That is what I loved about Steve Reynolds [longtime New Mexico state engineer]. He was honest enough to say, "Bruce, I loved the good old days, when governors were irrelevant." It was the state water engineer and the Washington delegation that counted in an era of supply side, reclamation-driven water resources development.*

Concerns focused on priority rights to divert water and on ways to make more of the water usable. The federal focus was on planning the development to maximize its economic benefits, engineering the project, constructing it, perhaps operating it, and collecting any payments that were to be made.

Now the values of water are viewed far more broadly, and those with an interest in the ways streams and aquifers are used extend well beyond groups holding water rights or hydropower contracts. Over the years, congressional authorizations of water projects brought in more of those interests—providing directly for fish and wildlife enhancement features, for example, or for recreational uses such as boating, fishing, and swimming in project reservoirs. As noted earlier, the Wild and Scenic Rivers Act gave those who favor free-flowing rivers a few rivers with special protection from further water development. CWA recognized those with special water quality

concerns, and ESA recognized those concerned with species protection. NEPA forced all federal agencies to evaluate the environmental effects of their actions, including those related to water. EPA required FERC to give consideration to environmental values in its licensing decisions.

The sum effect of these and other such federal actions has been to greatly extend federal power over how water resources are used and to legitimize the participation of multiple interests in federal water-related decisions. The effect of laws like the CWA and the ESA is to create federal regulatory water rights—that is, they gave the federal government control over water in a manner similar to that given to water users by water rights (Tarlock, 1985). In practice, federal agencies generally have worked hard to find an accommodation between the interests of water users and their responsibilities under these laws (MacDonnell, 1989). Not uncommonly, such accommodation has been sought through public processes involving multiple participants with direct interests in the matter (stakeholders) searching for acceptable solutions that meet the legal obligations of the agency, while allowing land and water uses to go forward. Federal agencies often hold a significant legal stick in these processes (e.g., denial of a section 404 permit or issuance of a jeopardy opinion). They may also possess valuable carrots in the form of grants moneys available under the CWA or cost sharing and incentive payments under USDA conservation programs. Skillfully used, these programs can provide considerable assistance in reaching some agreement.

On the other hand, federal agencies often find themselves restricted by the legal requirements they are directed to implement and by the processes they are required to follow. For example, the Clean Water Act sets out a number of very specific

## ***HCPs, "Safe Harbor," "No Surprises": New Approaches to Protecting Threatened and Endangered Species***

The number of endangered, threatened, and "at risk" species has increased steadily over the last 20 years. The need to protect the shrinking habitat of endangered species has caused conflicts with homeowners, developers, and other private landowners. Developers have worried that efforts and expenditures they made to preserve critical habitat would be for naught when the next endangered species was discovered on their land. Was there any end to their obligation? Some advocated a major overhaul of the ESA.

On the other side of the issue, environmentalists were not happy that action was being taken only when a species became critically endangered. Even then, the actions were piecemeal, not a coordinated effort to preserve major habitats.

The Administration responded to this growing crisis by examining the way the ESA was being implemented, finding that the ESA could provide protection to both the species and the private landowners if a "habitat conservation plan (HCP)" (permitted under the ESA) was implemented to preserve wildlife before a species became endangered. When such coordinated proactive plans are adopted, participating interests are assured they will not be obligated to make additional expenditures for protecting additional species that became endangered in spite of their efforts—there would be "no surprises."

The policies are working. Currently, 212 HCPs are in place with private landowners, and over 200 are in various stages of development. By September 1997, 18.5 million acres of land will be covered by HCPs. These agreements will protect over 300 species, including state and federally listed, candidates for listing, and species of special concern.

**The Legal Basis for HCPs.** The ESA states generally that it is unlawful for any person to "take" endangered fish or wildlife (16 U.S.C. § 1538). "Take" means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect (16 U.S.C. § 1532(19))." During the 1982 reauthorization of the ESA, the Congress included amendments to section 10(a) of the Act to allow the Service and the NMFS to issue "incidental take" permits. These permits would allow a private landowner to "take" a species while carrying out lawful activities which are conducted as part of an HCP. Such plans are viewed as necessary, since more than half of the species listed under the ESA have 80 percent of their habitat on private land. Incidental take permits are viewed as necessary to encourage private landowners to take measures to protect endangered species on their lands.

HCPs must contain:

- An assessment of impacts likely to result from the proposed taking of one or more federally listed species.
- Measures the permit applicant will undertake to monitor, minimize, and mitigate for such impacts; the funding that will be made available to implement such measures; and the procedures to deal with unforeseen or extraordinary circumstances.
- Alternative actions to the taking that the applicant analyzed and the reasons why the applicant did not adopt such alternatives.
- Additional measures that the Service may require as necessary or appropriate.

*Congress intended that this process be used to reduce conflicts between listed species and private development and to provide a framework that would encourage 'creative partnerships' between the private sector and local, state and federal agencies in the interest of endangered and threatened species and habitat conservation. Since the primary cause of species extinction is often loss of habitat, a typical HCP outlines measures for maintenance, enhancement and protection of a given habitat area. Developers, landowners and local officials work out the details; the Service acts as an adviser during HCP development, eventually weighing both public comment and the best available scientific evidence before making a permit determination. Plans typically include the establishment of mechanisms to minimize 'take,' provisions for land acquisition, habitat restoration and the relocation of plants or animals (<http://www.fws.gov/~r9endspp/factshts.html>).*

### **The No Surprises Policy: Further Clarification of HCPs.**

In May 1997, Interior proposed a rule to codify its "no surprises" policy. Although the policy was issued by the Service and NMFS in 1994, codifying the policy now is intended to further assure private landowners who have HCPs in place that the agencies will not impose additional conditions or requirements on the landowner if unforeseen circumstances arise during the life of the HCP. This means that once an agreement has been reached between the landowner and the federal government and the HCP permit

(See "New Approaches," next page)

### *New Approaches (continued)*

issued, the government will not require additional lands or land use restrictions or additional financial resources from the landowner, even if unforeseen circumstances indicate that additional mitigation is needed for a species.

**The Lower Colorado HCP.** In 1994, the Service designated almost the entire lower Colorado River as critical habitat for four endangered species. In response, representatives of Arizona, California, and Nevada, along with many other interest groups, have formed a regional partnership to develop a multispecies conservation program aimed at protecting sensitive, threatened, and endangered species of fish and wildlife and their habitat. The program covers the mainstem of the lower Colorado below Glen Canyon Dam out to the 100-year flood plain and covers more than 100 federal or state listed, candidate, and sensitive species and their associated aquatic, wetland, riparian, and upland habitats.

Over a 3-year planning period for development of the comprehensive program, interim conservation measures will be implemented to address the immediate critical needs for certain endangered species. Interim measures to benefit the endangered razorback sucker and bonytail chub are proposed for the first year. Planned to be implemented over a 50-year period, the comprehensive program will address future federal agency consultation needs under the ESA and nonfederal agency needs for endangered species incidental takings.

**HCP Critics.** Critics argue that HCPs give up too much regulatory authority without adequate assurances that its protection efforts will be successful. Some argue that HCPs are being developed too quickly, that years are required to adequately determine habitat needs. Others assert the lands being protected are either undevelopable or were already set aside as open space in development plan even without an HCP. Some support mitigation concepts only if the restored habitat is clearly greater than the lost habitat or if a fund were established for habitat acquisition (*High Country News*, 1997).

**Safe Harbor Agreements.** HCPs involve landowners who want to develop their property, while still providing some protection for endangered animals, and who need some certainty from the Service and NMFS their actions will not result in liability under the ESA. Conversely, Safe Harbor Agreements are for landowners willing to enhance habitat on their property now for ESA purposes, but who fear losing future use of their property.

Under the Safe Harbor Agreements policy, the Service and NMFS, in cooperation with appropriate state agencies and affected tribal governments, may provide property owners with credit for enhancing the recovery of a listed species by voluntarily improving habitat on private property above the current or baseline conditions. If the Service and NMFS find that a species will receive a net conservation benefit from voluntary conservation activities, property owners are assured they will not be held liable for protecting those improvements in perpetuity. The Service and NMFS would issue the property owner an "enhancement of survival permit" under ESA section 10(a)(1)(A) and at the end of the Safe Harbor Agreement, would allow the property owner to return the affected property back to baseline conditions even if it resulted in the incidental take of a listed species. As long as property owners complied with the terms and conditions of the Safe Harbor Agreement and permit, they could make any use of the property that maintained the agreed-upon baseline.

**Candidate Conservation Agreements.** Candidate Conservation Agreements are similar in principle to Safe Harbor Agreements but pertain exclusively to species that are facing threats but are not yet listed. The goal is to remove threats to eliminate the need for listing. If a species is nonetheless listed in the future, the Service and NMFS would authorize the property owner to return the property condition to the conditions mutually agreed to in the Candidate Conservation Agreement and would not require the property owner to do more to conserve the species. #

requirements for the control of point source discharges, limiting the potential for trading some of this control in return for cleaning up nonpoint source pollution. The Federal Advisory Committee Act limits an agency's ability to conduct multiparty negotiating processes. FERC operates under a very formal, quasijudicial procedure. The ESA prohibits federal actions considered likely to jeopardize the continued existence of protected species as well as private actions that might harm or kill such species.

Efforts are being made to work within these apparent limitations. FERC now encourages the license applicant and interested parties to seek negotiated agreement on terms and conditions prior to formal FERC involvement. Interior Department rules encourage participation of affected interests in recovery planning and implementation, as well as in using negotiated habitat conservation plans to accommodate development and conservation interests under the ESA. Nevertheless, there are limits to which existing legal requirements can be maneuvered to allow for negotiated resolution.

The nature of today's water problems is forcing a reexamination not only of related federal laws and programs, but also of the manner in which federal agencies are organized and operated. Traditionally, federal agencies have organized around program areas for broad policy objectives such as water development for irrigation, river regulation for flood control, or management of national forests. Agencies tended to pursue these objectives by working directly with the affected constituencies, usually with little or no connection to other federal or state agencies or to others not within these constituencies. Now, however, as noted earlier, federal environmental laws have opened federal decisionmaking to the public, and environmental interests have inserted themselves actively into many federal processes. It is no longer possible to make decisions about such things as irrigation water development, flood control, or national forests without considering their environmental effects.

Moreover, these effects can only be understood by reference to the place where the development activity will take place. The effects are not abstract matters of policy, but are tangible consequences to such things as the quality of water in a particular stream, the stream's fishery, recreational uses of the stream, or productivity of a particular wetlands. The degree to which human development can and should alter or diminish such values is a difficult decision. Federal law has set some baselines related to water quality and endangered species protection, and federal agencies are required to protect those baselines, but experience to date with purely regulatory resolution of such matters has proved to be unsatisfying in many instances (Howard, 1994), prompting increased use of more cooperative efforts to find mutually acceptable outcomes.

Agencies are reorganizing themselves more along ecosystem or watershed lines, often linking with other agencies working in these same areas, as well as with locally organized councils or other such informal organizations that have been formed to address some particular problem or need. Sometimes these efforts have themselves been formalized, as with the CALFED program in the Bay-Delta of California. More often, they simply reflect the agency's own sense of what will better enable it to carry out its responsibilities—for example, Reclamation's creation of area offices.

Federal objectives related to water have never been unidimensional, and that remains true today, but it is possible to generalize that the fundamental objective has shifted from maximizing water development to promoting its sustainable use. Much could be done to improve the manner in which federal policies and programs pursue this objective, and the Commission offers some recommendations to this purpose in chapter 6.

## The Future Federal Role

Given the extensive federal water infrastructure in the West and the importance of national health and environmental standards for water, the federal government will continue to play a major role in western water management. However, a major historic tool of federal involvement—that is, the nearly exclusive federal funding of major water storage projects—will be less available in the future. New storage projects will be smaller, more efficient, more often located offstream, and generally part of a solution to larger basin problems. The federal share will be less than it has been in the past. Also, where major federal investment is made, the emphasis will now be on environmental restoration, improved operation of the federal river control systems, and settlement of Native American water claims.

Addressing tribal water rights is clearly an unfinished federal task, and it will likely occupy a significant part of the traditional federal water budget. While primarily a federal responsibility, this difficult task will also involve and affect state and local water organizations. Resolving these claims without massive infusion of federal funds will test the capacity of all western water institutions and political leaders to work together.

Although the federal government may continue to seek transfer of some of its water project facilities to nonfederal entities, future transfers are likely to be limited to single-purpose features, such as irrigation distribution systems. Thus, the operation of large multipurpose water projects will continue to be a major federal role in the West. As stresses on the western river systems grow, the role of the federal government also will grow as a convener and facilitator of negotiated reoperation of projects to meet new demands. A special challenge in this role will be for the federal estate to develop unified positions among its agencies representing diverse statutory goals and constituencies.

National environmental standards will continue to play a major role in driving western water decisions. Exploration of ways to enable more state and local participation in implementing these national standards should continue. The reduced and redirected federal role that may emerge will produce a general diffusion of power among federal agencies and present the states with new opportunities and challenges. The states will have more opportunity to influence federal policy, but they will be held more accountable for a broader range of issues than they have in the past. Incentives will need to play a greater role in the regulatory structure; however, given the reduction in federal budgets for water, incentive programs will need to rely on partnering, cost sharing, and nonmonetary incentives.

A substantial role remains for the federal government in water data collection, coordination, dissemination, and more regulatory science. Federal agencies must work with state and other water users and interest groups to define the needed data and research, to coordinate these functions efficiently among the federal and state agencies, and to make data available to all users in a timely and accessible fashion. Data are needed that can answer, over some reasonable time horizon, the difficult resources management questions that we all face.

## The Prospects for Federal and State Collaboration

Despite their shared interest in water development, there have always been some differences between the federal government and the states concerning western water. Reclamation, for example, became primarily interested in building projects that it regarded as best suited to comprehensive river development, focusing first on those areas with the greatest opportunities to use the water and power made available. Thus, in the Lower Colorado River basin, Reclamation promoted projects benefiting users in California—much to the displeasure of

Arizona and the discomfort of Colorado and other Upper Basin states (McDonald, 1997).

The near-transformation of federal water projects into public works projects in the 1930s temporarily reduced some federal/state differences, but it also had the effect of greatly increasing federal control—not only of the planning and construction of individual projects and of the uses to which they were to be put, but also of the manner in which large river systems were to be developed and used. For the most part, states accepted this control as the price for getting projects that yielded substantial local and regional economic benefits.

In the 1950s, as the political popularity of federal water projects neared its apogee, a reaction set in—fueled primarily by the growing costs of new projects and their increasingly questionable economic benefits. Antidam environmental interests waged an effective campaign against Echo Park Dam, proposed for construction on the Green River within Dinosaur National Monument (Martin, 1990). And some in the more conservative Eisenhower Administration opposed such large-scale government involvement in matters they felt should be essentially private. By the time the Congress passed the Water Resources Planning Act of 1965, the movement toward more centralized water planning and development had peaked and was shifting in other directions.<sup>5</sup>

As discussed, the nature of today's water problems has changed from large-scale development to making uses sustainable, from increasing the usable supply of water to making efficient use of the available supply, from controlling rivers to restoring

their natural functions and processes where possible, from concerns about quantity to concerns about quality. Federal and state government functions are changing as well in response to these concerns, as is the relationship between the federal government and the states.

The Congress asserted a primary federal role in many aspects of environmental protection beginning in the 1960s. Thus, for example, it prohibited point source discharges except in compliance with nationally established treatment standards. Implementation authority could be delegated to the states, but only if they agreed to follow the requirements of the Clean Water Act. Federal agencies were given authority to control uses of wetlands and to prohibit activities that would harm or kill an endangered species. In short, just as federal river basin planning and management for water development purposes were falling out of favor, federal regulation of water development generally for environmental protection purposes was burgeoning.

At their core, federal environmental laws set a rough kind of baseline. In some cases they are quite specific—for example, regarding the manner in which pollutants may be discharged from point sources or in the quality of drinking water that public water suppliers must provide. In other cases they seek to induce desired results—particularly by offering grants or direct payments for those who will do things thought by the funding agency to promote certain environmental protection objectives. Occasionally these laws empower designated federal agencies to be a kind of consultant to other federal agencies on matters of environmental protection—as, for example, the Service and the NMFS determining whether proposed agency actions are likely to jeopardize a protected species. More commonly, they designate a particular federal agency to be the final arbiter of the environmental acceptability of certain types of development activities such as filling and using a

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<sup>5</sup> This law authorized federally driven river basin commissions to coordinate basin water development and established a Water Resources Council composed of the Secretary of the Interior; the Secretary of Agriculture; the Secretary of the Army; the Secretary of Health, Education, and Welfare; and the Chairman of the Federal Power Commission.



## ***The Platte River Agreement: Historic Federal/Three-State Initiative<sup>1</sup>***

After 20 years of conflict over the effect of water projects on endangered species in the Central Platte River, the states of Colorado, Nebraska, and Wyoming have signed a cooperative agreement with Interior to undertake a joint program of restoration and management of the Platte River system to address endangered species concerns.

### ***The Platte Rivers***

The North and South Platte Rivers originate from snowmelt in the Colorado Rocky Mountains, enter Nebraska via Wyoming and Colorado, and join to form the Platte River at North Platte, Nebraska. Just above North Platte, on the North Platte River, is Kingsley Dam. Kingsley Dam holds back 1.8 million acre-feet. Lake McConaughy serves as the major storage facility for two irrigation and power districts and provides surface irrigation for 215,000 acres and groundwater supplies to 500,000 acres of highly productive farmland in central Nebraska. Lake McConaughy receives 70- to 80-percent of its inflow from upstream return flows from irrigated lands in eastern Wyoming and western Nebraska, which are supplied from Reclamation reservoirs in Wyoming.

Below North Platte, Nebraska, beginning at Lexington, Nebraska, is an area known as "The Big Bend." This marks the beginning of 51 miles of critical habitat for the endangered whooping crane and serves as migratory habitat for the only remaining wild reproducing population of approximately 136 birds. This area is also nationally and internationally significant for its annual use by 7 to 9 million waterfowl for breeding and migratory habitat.

Nine threatened or endangered species listed under the ESA depend on the Platte River in central

Nebraska, including piping plovers and interior least terns which nest on unvegetated sandbars in the river and sandpits along the river. The endangered pallid sturgeon inhabits the lower reaches of the Platte River and appears to need the high spring pulse flows for spawning.

***FERC Relicensing.*** The original hydropower licenses for Kingsley Dam and its related facilities were issued to the Central Nebraska Public Power and Irrigation District and Nebraska Public Power District (the Districts) in 1937.

The Districts' FERC licenses expired in summer 1987, and the projects have been operating with annual licenses for 10 years. Interior, Wyoming, Colorado, U.S. Environmental Protection Agency, environmental organizations, and over 50 other parties intervened in the formal FERC relicensing proceedings, largely in response to irrigation needs and environmental concerns.

Consultation under section 7 of the ESA was initiated in 1996 to insure that FERC actions are not likely to jeopardize listed species or adversely modify or destroy critical habitat. The draft biological opinion concluded the continued operation of the project, as proposed by FERC staff, would cause an annual depletion of 305,000 acre-feet in the critical habitat area and was likely to jeopardize four species, through habitat degradation, and adversely modify critical whooping crane habitat. To conserve the habitat on which species depend, the Service established that an additional annual average of 417,000 acre-feet of water is needed to reduce the shortage relative to current flow conditions in the Big Bend reach. Additionally, a joint federal/state/water user study concluded that 29,000 acres of wet meadow and channel habitat should be restored and preserved.

(See "Platte," next page)

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<sup>1</sup> This discussion was drawn from *Integrating New Values With Old Uses in the Relicensing of Kingsley Dam and Related Facilities (Making Part of the Problem Part of the Solution) Dams: Water and Power in the New West*, by Margot Zallen, Senior Attorney, Office of the Regional Solicitor, Rocky Mountain Region, U.S. Department of the Interior, Denver, Colorado. Ms. Zallen presented this paper in June 1997 at the University of Colorado School of Law, Natural Resources Center. The views expressed are the personal views of the author and not necessarily the views of the Solicitors Office, the Department of the Interior, or the United States.

ADR is not a panacea, but it does provide flexibility to address and involve a wider range of people and issues than is often the case with legal proceedings. This flexibility is an asset when trying to resolve complex issues with more of a watershed or river basin focus.

The Commission offers the following recommendations to encourage the greater use of ADR in water disputes and to direct its application appropriately.

1. State legislatures should consider legislation similar to the Federal Administrative Dispute Resolution Act to provide clear authority to state agencies to use ADR and to provide proper procedures.
2. The Congress should consider changes to regulations governing the major environmental statutes to:
  - (a) Identify specific decision points at which an individual or applicable agency could initiate an ADR process to address disputes.
  - (b) Authorize agencies to allocate funds for joint fact-finding and other ways of improving resolution of technical disputes.
3. Appropriate government research institutions should consider funding more research and evaluation on the use of ADR in resource disputes and other public policy matters.
4. We recommend that the emerging river basin processes institute mechanisms by which those who are in disagreement with governmental regulatory decisions may engage in mediation or, where appropriate, stipulated binding arbitration through an independent mediator or arbitrator or a coordinated agency tribunal.

**Revising the Principles and Guidelines.**—The *Principles and Guidelines for Water and Related Land Resources Planning* (U.S. Water Resources Council, 1983) were developed to guide the formulation and evaluation of water projects. They set the standard for analysis of proposed projects by the Office of Management and Budget and the Congress. The Commission recommends that these standards be updated to make them a more useful guide and decision tool for today's broader range of water management activities.<sup>24</sup>

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<sup>24</sup> Revisions to be considered should include:

1. In cases with significantly increased local cost-sharing, allow for greater flexibility in defining local objectives. Allow for some version of the "shared vision" approach in planning and designing water projects. This would move away from strict formulation criteria toward a consensus-building and negotiation process in which agreements are reached among stakeholders on the acceptable magnitude and distribution of costs associated with achieving a given social, economic, or environmental objective.
2. For federal portions of projects, allow the nonmonetary Environmental Quality account to be treated equally with the National Economic Development account.
3. Improve the methodologies used in the benefit/cost analysis performed under the *Principles and Guidelines for Water and Related Land Resources Planning*, addressing such changes as: discontinuing the use of "avoided costs" as measure of economic benefits for municipal and industrial projects; explicitly incorporating risk and uncertainty; providing a more comprehensive treatment of methodologies for estimating non-market benefits; including a specific discussion on the proper approach to valuing environmental quality changes; providing additional guidance on the issue of benefits transfers; and addressing the extent to which water resource projects should be required to use a discount rate that differs from the discount rate used for evaluating other federal investments.

## *Platte (continued)*

**Federal Projects.** Federal dam operations on the North Platte River and the Colorado-Big Thompson Project on a South Platte tributary have been under ESA consultation for years. Since 1978, the Service had determined that basin depletions were likely to jeopardize listed species and result in critical habitat damage. In light of these ESA consultations, Reclamation, the Service, and water users have been constructing a basinwide hydrologic model so that Reasonable and Prudent Alternatives under the ESA could be developed. As the hydrologic model was being finalized, water users in Wyoming and Nebraska became increasingly concerned that water deliveries would be curtailed.

**Municipal Water Supply.** Additionally, a number of Forest Service authorizations have expired or are about to expire in the Colorado Front Range. In 1993, the Service issued a draft biological opinion for seven municipal and industrial water projects that recommended foregoing diversions equal to the projects' consumptive use so as to avoid violating the ESA. Project sponsors objected, asserting that the water would never get to the Nebraska habitat but would be diverted by surface water users in Colorado and Wyoming.

**Nebraska v. Wyoming.** Additionally, Nebraska filed suit in 1986 petitioning the Supreme Court to enforce a 1945 decree limiting irrigation use in Colorado and Wyoming and apportioning the surface water of the North Platte River between the Whalen and Tri-State diversion dams (the pivotal reach) during irrigation season, 25 percent to Wyoming and 75 percent to Nebraska. The claim alleged that existing and threatened tributary development, including the construction of the Deer Creek Dam and Reservoir, threatened the equitable apportionment of the 1945 decree.

### **The Agreement**

With various licenses, lawsuits, water projects, and water permits in three states all impacting the habitat for endangered and threatened species of the Platte River, a basinwide solution was a necessity. After 20 years of conflict and studies, and 3 years of active negotiation, common ground was created in the form of a cooperative agreement signed on July 1, 1997, by the Secretary of the Interior and the Governors of Colorado, Nebraska, and Wyoming.

Until water users in all states faced the real possibility that they each would have to implement measures that were far more onerous than they believed tolerable, there was no way to begin basinwide negotiations. Without the pressure induced by the potential power of the ESA, the states and its water users lacked sufficient incentive to resolve the serious environmental issues of the Central Platte.

The cooperative agreement contains several key elements:

- During the anticipated 3 years of the cooperative agreement, the parties are to develop a basinwide recovery implementation program for whooping cranes, piping plovers, interior least terns, and pallid sturgeons that would serve as the reasonable and prudent alternative for existing and water-related activities in the basin. Another agreement between the Service and the districts will settle all of the wildlife issues in the FERC relicensing and sets forth the district's responsibilities during the cooperative agreement and the proposed program alternative.
- The parties developed a proposed program which will be evaluated under NEPA along with other alternatives. The Service is to give its biological opinion on the sufficiency of the proposed alternative to serve as the reasonable and prudent alternative for all projects in the basin and on the preferred alternative, if different from the proposed alternative. If the preferred alternative is not acceptable to the parties, new, more difficult negotiations will ensue.
- The cost of the studies for the NEPA evaluations is anticipated to be \$5 million, and the cost for the first increment of the proposed alternative is approximately \$70 million, with Interior responsible for 50 percent and the states responsible for 50 percent. Colorado and Nebraska are each responsible for 20 percent, and Wyoming is responsible for the remaining 10 percent.
- Under the proposed alternative, the states will regulate flows to reduce shortages by 70,000 acre-feet. The remaining 60,000 acre-feet of shortage reduction is to be achieved through water conservation and water supply projects, and each state will be responsible for mitigating the future depletions in its own state.

The cooperative agreement establishes a Governance Committee to oversee the effort. Each state, Reclamation, and the Service has one representative, the environmental communities in the three states have two, and the water users have three. A land committee is to be established to develop a plan for acquiring and managing the land habitat, with a long-term goal of 29,000 acres. A water management committee is to develop a water accounting procedure to determine water depletion or credits associated with existing or proposed water diversions or water conservation projects in the three states. #

wetlands or constructing and operating (or continuing operation of) a nonfederal hydroelectric generating facility, or of the acceptability of a proposed activity concerning certain kinds of environmental effects, such as jeopardizing protected species.

Assessing the adverse environmental effects of proposed federal actions or the environmental acceptability of proposed development activities involves matters about which reasonable people can disagree. The issues typically are complex and the uncertainties enormous. Federal law can make an agency the final decisionmaker, but it cannot make decisions. Partly in response to such concerns, there has been a pronounced trend toward using more collaborative, negotiated processes to develop agreement where possible. Federal law serves as the impetus to take action, as a convener of the interests necessary to reach resolution.

The Upper Colorado River Recovery Program and the CALFED Bay-Delta Program, already discussed, are examples of multiparty, collaborative efforts to meet what are primarily federally driven objectives in a manner acceptable to the responsible federal agencies, the states, and the affected interests. A more recent example is provided by the agreement reached between the federal government and the states of Colorado, Nebraska, and Wyoming concerning recovery of endangered species within the Platte River basin in 1997. Driven primarily by federal obligations under the ESA to protect the whooping crane, the interior least tern, the piping plover, and other species, the agreement creates a governance committee composed of one representative from each of the states, two federal agency representatives (Reclamation and the Service), two environmental representatives, and three water user representatives (one for the North Platte, one for the South Platte, and one for the central Platte). As with the Upper Colorado River Recovery Plan, efforts under the cooperative agreement avoid the need to develop individual

reasonable and prudent alternatives to offset impacts of existing and proposed water development within the basin. An interesting aspect of the agreement is that the states have agreed to take responsibility for mitigating the impacts of new water-related activities in their states.

Still another model is presented by the Northwest Power Planning Council (NPPC). In 1980, the Congress passed the Pacific Northwest Electric Power Planning and Conservation Act to better integrate planning to meet the region's growing power needs with environmental effects of power generation, particularly the impacts of hydroelectric power facilities in the Columbia River basin (Lee, 1993) (P.L. 96-561, Dec. 5, 1980, 94 Stat. 2697, codified at 16 U.S.C. §§ 839-839h) (Volkman, 1997, 1996). It established the Northwest Power Planning Council, with two members from each of the four Pacific Northwest states appointed by the governors. As described by former NPPC member Kai Lee: "The council is in effect an interstate compact, a form of government organization that shares both state and federal authority" (Lee, 1993). The NPPC has been a primary forum in the Pacific Northwest for the difficult work of attempting to restore the Columbia River ecosystem to a condition that can once again support viable salmon populations. The NPPC has brought together all of the stakeholders, including the full range of federal agencies, states, tribes, local governments, and interest groups. It has been the coordinator for data collection, scientific research, and public education on the issues throughout the basin.

States increasingly play a key role in such processes because of their intermediate position between federal requirements and the effects of these requirements on their citizens. In many instances, states can represent local water user interests in federally driven decision processes more effectively than can any single water district or coalition of districts. Governors and heads of state departments of natural resources remain committed to protecting

the legal rights and interests of water users, but they are aware of the growing pressures on their water resources and the need to reflect the broader range of interests now involved in water matters.

As illustrated, there has been increased interest in directly involving water user and environmental interests in such processes. The work of making water uses more sustainable begins in the watershed in which water supplies originate; moves to the places where water is stored, diverted, and used; and continues with the water that returns to the hydrologic system. Opportunities to make water development compatible with system functions are typically site specific and likely to be best known to those closest to the opportunity. Moreover, solutions commonly involve tradeoffs, and existing practices may need to be changed. Participation in a problemsolving process can help make participants more supportive of agreed-upon outcomes.

One of the motivations for national environmental laws was the perception that states were largely unwilling and unable to place the kinds of restrictions on economic development necessary to provide environmental protection. As public support for environmental protection has grown, some states, as mentioned earlier in this chapter, are developing their own programs and activities aimed at making water uses sustainable. Some of these are instigated federally but are developed and

implemented at the state level, such as efforts under Section 319 of the Clean Water Act to address nonpoint source problems. Some state programs might best be characterized as pre-emptive efforts to ward off the more onerous results of federal regulation, such as efforts by Colorado and other states to identify species with the potential to be listed for protection under ESA and to attempt to increase their viability so that such listing will never happen.

Many reflect the growing interest in the states themselves with matters of environmental protection, particularly related to such things as fish and wildlife, as well as recreation.

In the final analysis, federal and state interests in water probably do not diverge greatly on general objectives. Rather, the tension revolves primarily around means. How do we best move toward this elusive thing called sustainability? What does sustainable use of water mean? What does this mean for those with existing water uses? What does this mean for those with new demands? Who decides? Who pays? These are all difficult questions. No single level of government, no single water interest, no individual can pretend to have the answers. Indeed, there probably are no absolute answers. Instead, answers will be worked out issue by issue, problem by problem, proposal by proposal.

balanced slate of members, for deliberating policy options in a public setting, and for providing public notice of meetings and careful recordkeeping. Any group of non-federal employees which is utilized by the federal government for advice must meet the requirements of FACA.

However, many federal managers perceive FACA as restricting their efforts to work informally with groups that are addressing local watershed problems, but not providing formal recommendations to the government. In some cases, FACA has been interpreted as applying to these local groups. In such cases, the membership of such groups, their meetings, agendas, and recordkeeping would be subject to FACA requirements—an imposition that is unwanted by local groups.

A recent analysis of court cases involving FACA by Rieke (1997) suggests that this interpretation is not correct, but also suggests that clarification of FACA regulations is needed. Recently, the General Services Administration, which administers FACA, has announced its intent to revise the FACA regulations.

The Commission recommends as part of their review, that the definition of groups "utilized by a Federal agency" be clarified based on recent court rulings to make clear that it is permissible for an agency, without triggering FACA requirements, to:

- (a) Participate with or on local groups in order to provide technical assistance, advice, or coordination in pursuit of activities of interest to the agency, and
- (b) Obtain input on agency activities from such local groups, as long as the group is not the sole or primary source of public input to the agency, and as long as the membership and agenda of the group are not established by the agency.

The Commission also recommends that the Administration rescind Executive Order No. 12838 which directs that no new Federal Advisory Committees be chartered except based on compelling considerations of national security, health or safety, or similar interest. Because we view Advisory Committees as useful tools for consultation, we believe that this order sets the standard for creation of an Advisory Committee too high. As Rieke states, "The FACA standard, requiring advisory committees to be in the public interest in connection with lawful duties of the agency, appropriately leaves to agency personnel the decision whether an advisory committee is needed."

**Alternative Dispute Resolution.**—The last two decades have seen a great increase in the use of alternative dispute resolution (ADR) methods. ADR is composed of a group of negotiation and conflict-resolving techniques for settling disputes outside of judicial proceedings, most often using a neutral facilitator or mediator to help structure and manage the process. ADR programs are widely incorporated in local and state justice systems as an alternative to trials, while the Congress and the federal government have promoted ADR within their own jurisdictions, primarily to resolve labor disputes, contract disputes, and human resources problems.

For the last 25 years, ADR has also been applied to resolve conflicts over natural resources, including water resources. Agencies such as EPA have instituted negotiated rulemaking to involve affected parties in the formulation of regulations. ADR methods have been used to resolve surface and groundwater allocation decisions; to address water quality matters including effluent standards, discharge permits, drinking water treatment, and instream habitat; and to construct projects related to port development, water storage, hydropower, and flood control (Bingham, 1997).